

BEAT THE HEAT: HOW TO STAY COOL NATURALLY, P. 34



**GROW
GREAT
GARLIC**
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MOTHER EARTH NEWS

THE ORIGINAL GUIDE TO LIVING WISELY
AUGUST/SEPTEMBER 2015

EAT FROM YOUR GARDEN ALL YEAR

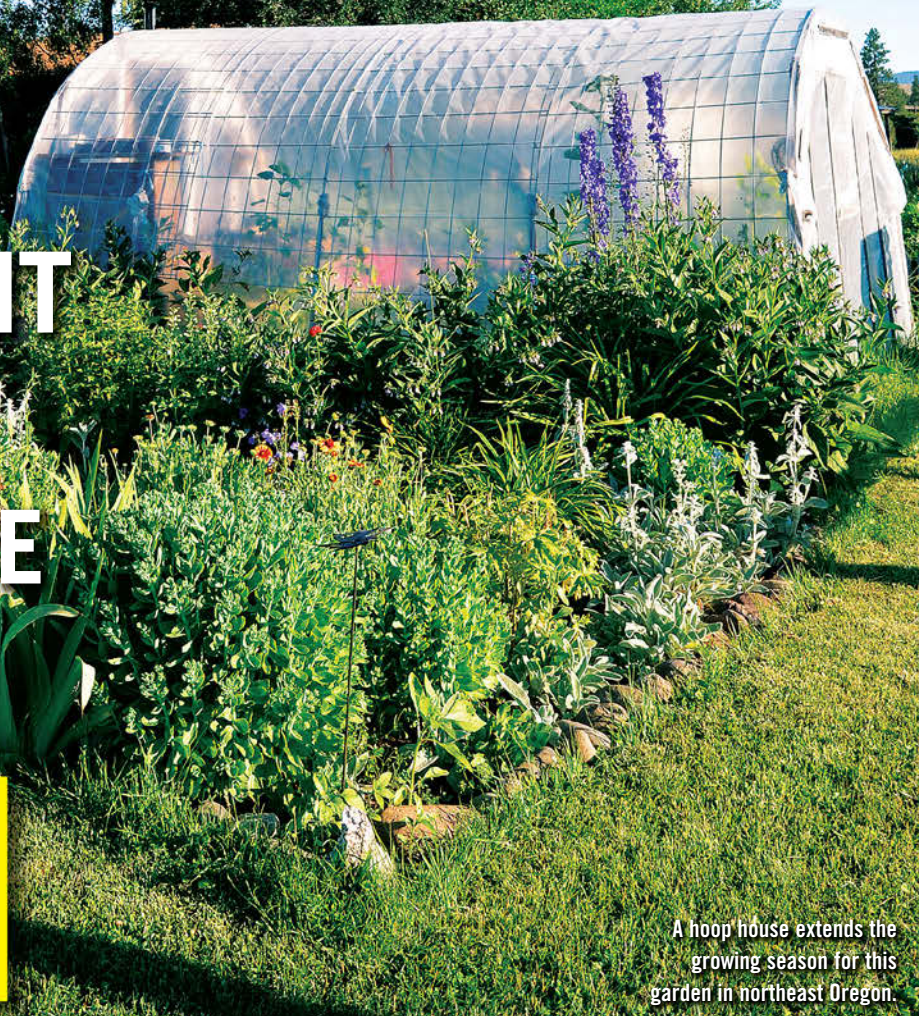
THE MANY
PATHS TO
SELF-RELIANT
LIVING

LYME DISEASE
AND TICKS

What You Need to Know

PLUS:

Solar Cooking How-To
Homestead Dairy: Cows or Goats?
Best Cider Apples — Plus a DIY Press
Government Deception and GMOs, P. 11



A hoop house extends the growing season for this garden in northeast Oregon.

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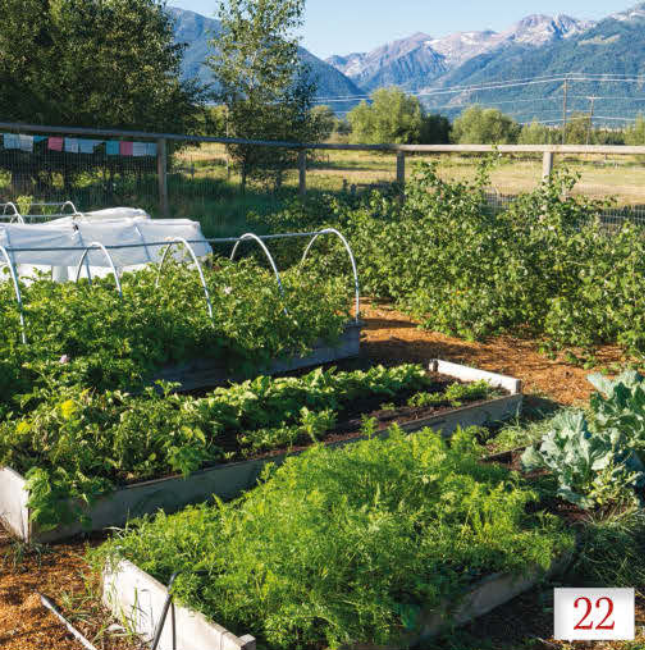
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BELOW: SUPERSTOCK/AGE FOTOSTOCK; RIGHT: PHILIP REYNOLDS



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BARBARA DAMROSCH



LIZ PEPPERELL



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Mary Maude Daniels

MOTHER EARTH NEWS (ISSN 0027-1535) is published bimonthly, six issues per year, by Ogden Publications Inc., 1503 SW 42nd St., Topeka, KS 66609. Periodical postage paid at Topeka, KS 66609, and at additional mailing offices. **Subscriptions:** \$19.95 for one year in the United States and its provinces; \$27.95 per year in Canada and \$31.95 per year foreign, prepaid in U.S. funds. (CANADA GST NBR. 89745 1720 RT0001). **Postmaster:** Send changes of address to MOTHER EARTH NEWS, 1503 SW 42nd St., Topeka, KS 66609-1265. **Subscribers:** Write to MOTHER EARTH NEWS, 1503 SW 42nd St., Topeka, KS 66609-1265 or call 785-274-4300 or 800-234-3368. Outside the U.S., call 785-274-4300. **Subscribers:** If the Post Office alerts us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years. To purchase back issues from January 1995 to present, send \$7.50 per issue to MOTHER EARTH NEWS Back Issues, 1503 SW 42nd St., Topeka, KS 66609. Copyright 2015 by Ogden Publications Inc. All rights reserved. MOTHER EARTH NEWS is a registered trademark. Material in this publication may not be reproduced in any form without written permission. Permission requests must be in writing and should be directed to Bryan Welch; MOTHER EARTH NEWS Permissions, 1503 SW 42nd St., Topeka, KS 66609. Send story ideas to Cheryl Long at MOTHER EARTH NEWS, 1503 SW 42nd St., Topeka, KS 66609. Ogden Publications Inc. cannot be held responsible for unsolicited manuscripts, photographs, illustrations or other materials. Printed and manufactured in the United States of America. Publications Mail Agreement No. 40754547. Return undeliverable Canadian addresses to: MOTHER EARTH NEWS, P.O. Box 875, STN A, Windsor, Ontario, Canada N9A 6P2.

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Renewable Energy Charges Forward

Good news continues to roll in on the renewable energy front. Earlier this year, we reported on the steady drop in solar panel prices and revealed that renewable energy now costs less than coal power in some areas (Green Gazette, April/May 2015). Our latest news comes from Elon Musk, the celebrated developer of the Tesla electric car. Musk has announced that his company will be manufacturing batteries to store energy generated by solar and wind systems, with a predicted price tag of *less than half* the current battery costs. This reduced price point is huge news for the energy landscape.

Tesla is building a giant factory in Nevada to ramp up production of these lithium-ion power-storage batteries, which will be designed for both electric utilities (the "Powerpack") and home-scale setups (the "Powerwall"). Many analysts are predicting that this development will be a crucial game-changer that could ultimately—Hooray!—end our fossil-fuel addiction and the endless wars we've waged to protect "our" oil supply. Plus, this development should finally halt the use of nuclear power, and slow the insane rush of fracking for natural gas.

The biggest barriers to expanding solar and wind have been solar's daytime-only capacity and the variability of wind power. Better, lower-cost storage batteries are already rapidly resolving these challenges, and Tesla's new options will be another exciting leap forward. The use of these revolutionary batteries also means utility companies can stop building more unpopular, expensive, giant, long-distance transmission lines and quit relying on natural gas plants to support the grid during periods of peak demand. Better battery storage

will give homeowners who don't own solar or wind systems a new option for backup power when the grid goes down.

Even before Musk made headlines with his April 30, 2015, announcement about the Tesla home battery pack, the Rocky Mountain Institute predicted that "rising retail prices for grid electricity and declining costs for solar PV and batteries mean that grid-connected solar-plus-battery systems will be economical within the next 10 to 15 years for many customers. Thus, it's critical that utilities, regulators and other stakeholders urgently pursue reform to embrace solar, batteries and other

distributed energy resources as an integral, optimized part of the future grid, rather than as a threat to that grid."

Musk has made dramatic predictions about his new batteries, and some feel he's being overly optimistic. But his storage batteries are by no means

the only game in town. Many other kinds of batteries are already on, or coming to, the market, including advanced lead-acid, sodium-sulfur, many variations of lithium, plus iron-chromium and vanadium flow batteries. Flow batteries are bulkier than lithium options, but can last much longer. Innovative energy solutions are proliferating these days, and invention is in the air. Storing energy in compressed air? Or by making ice? We've only just begun to see where developers' imaginations can take us.

Most analysts say that Musk's less expensive power-storage batteries, together with other declines in solar and wind costs, will "disrupt" the grid even faster than projected. This is great news for those of us pushing for policies that will reduce greenhouse gases and thus slow climate change.

—MOTHER

Game changer:
New storage
batteries will be
half the cost of
current options.

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MOTHER EARTH NEWS is published by Ogden Publications Inc.,
1503 SW 42nd St., Topeka, KS 66609, 785-274-4300.

For subscription inquiries call 800-234-3368.

Outside the U.S. and Canada, call 785-274-4300; fax 785-274-4305.

Subscribers: If the Post Office alerts us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years.

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Circle #1; see card pg 81



“I’m so inspired by the idea of building my own home.”



Reader Jackilyn Andrews of California dreams of one day creating a homestead.



EDITORS' PICK

A Baking Breakthrough

I picked up the 2015 *Guide to Fresh Food All Year* special issue and read it cover to cover. I really enjoyed all the stories. I'm a city boy longing for a country life. When I came across William Rubel's article "Truly Easy and Delicious Homemade Bread" (<http://goo.gl/PSBh32>), I thought, "Yeah, right. We'll see." I've tried making bread before and failed miserably. Just ask my wife, kids and even my dog—they've all tried to cut, chew and swallow the results of my bread-baking attempts.

Although I was reluctant, Rubel said it was easy, so off I went on another baking adventure. This time, my loaves turned out great. The entire family enjoyed them so much that the dog didn't get any! Well, OK, he got a little—but only because he's a part of the family, too. I was also pleasantly surprised by how long the bread stayed fresh—about 10 days!

Mike Hyder

Holly Springs, North Carolina

Inspiring the Next Generation

I read the article "Top Tools for a Half-Acre Homestead" by Lloyd Kahn in your June/July 2015 issue, and I'm so inspired by the idea of building my own home. I'm 23 years old, and I'm discovering the world of sustainability while thinking about building my own personal homestead. I'm still young, but I hope to have a home and garden that I put a lot of care and hard work into, while making a mindful effort to repurpose materials.

I've always been excited to see MOTHER EARTH NEWS in my mailbox, and I want

to assure you that even the younger generation is interested in fostering a healthy planet, body and mind. Your magazine has given me a lot of tricks and tips to get started on being more self-sufficient. Thanks for the inspiration!

Jackilyn Andrews

Eureka, California

A Saddened Seed-Sharer

In response to "Seed-Sharing Snafu" (News from MOTHER, April/May 2015): I live in Minnesota and wasn't aware of the laws restricting "regular people" from sharing seeds. I'm sad and disap-

pointed to hear that an innocent thing I've done can be considered a crime! I signed the petition at www.SaveSeedSharing.org, and I hope your other readers do, too.

Jamie Peterson
Isanti, Minnesota

Good news, Jamie: The Minnesota legislature recently changed the law—seed sharing and seed libraries are now legal there!—MOTHER

Raving About Renewables

Green Gazette is one of my favorite sections of your magazine. Thanks for

MOTHER'S Wish List

Visit our community Facebook pages. We've created Facebook pages for each of the 50 states and 10 Canadian provinces. Our goal is for those of you who use Facebook to "like" your state's page in order to share local news and network with your neighbors. Check it out at www.MotherEarthNews.com/Facebook.

State Facebook page managers. We're recruiting volunteers to help run our community Facebook pages. We're looking for managers who are well-acquainted with how to use Facebook, and are tuned into their local gardening, homesteading or environmental scenes. If you would like to help, email Letters@MotherEarthNews.com with the subject line "Community Facebook Manager."

Pastured meat testing. MOTHER EARTH NEWS is coordinating a project to test omega-3 fatty acid levels in pastured meat, eggs and dairy products. If you raise pastured animals, you can sign up for a 20 percent discount to have your products tested. Learn how to participate at <http://goo.gl/cmcfG5>.

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Dear MOTHER

continually providing articles on renewable, Earth-friendly energy resources, such as solar and wind. It's refreshing and encouraging to see that jobs are also following these new and emerging alternative energy sources, and that prices for consumers are dropping. Our ability to more efficiently convert

sunshine into energy has happened quicker than anyone predicted, and wind power has also become cheaper and more widespread.

I hope we can continue down this road toward a healthier planet and energy independence.

Rick Thorum
Midvale, Utah

Fighting for Food Freedom in Florida

Today, I received a letter from my homeowners association (HOA) stating that "the garden that's in the front of the house must be moved to the rear of the home, and the landscape

(CONTINUED ON PAGE 78)

The Power of Voting with Our Dollars

On the MOTHER EARTH NEWS Facebook page, we posted an article from Fortune magazine titled "Special Report: The War on Big Food" (<http://goo.gl/kSYWfz>). The article spoke about the declining sales of huge food conglomerates, such as Nestlé and Campbell's, and we were proud of your comments about how you vote with your wallets to put pressure on Big Food and industrial agriculture. Here are a few standout responses:

My Dad started us off on conscientious purchasing when apartheid was a problem in South Africa. He explained it to us, and then said, "From now on, we don't buy anything from South Africa." I have purchased items based on these kinds of standards all of my life, and now I'm 70 years old. I pay attention to countries and companies who make bad decisions—one example being Nestlé, which claims that no human being is entitled to water. You can't trust governments or corporations. Instead, vote with your dollar. —Jo Rewers

I'm not a big fan of many of the mega-corporations mentioned in this article, but I don't like the idea of increased government involvement either, because I don't trust the government's judgment. The best way to voice our concern is to control these companies' sources of income. —Justin Love

It's amazing how powerful we can be when we vote with our wallets. I've started contacting companies to request a list of ingredients in a product. I'm informing them that if they can't—or won't—give me this transparency, then I'll just take them off my list of companies to buy from. —Misty Fields

Purchasing power—where and how we spend our money—is a consumer's true influence. Companies will follow the money, even if they don't believe in the mission. But we have to be vigilant, and not confuse each other by labeling products with fluffy terms, such as "natural," that don't have any true meaning. —Elizabeth Nannini

How we spend our money is the only way to influence the marketplace. The power of individuals to support the kind of food industry they want is much larger than most believe. —Denece Vincent

A lot of people seem to think a big mystery machine is behind each corporation, and that it's some entity that puppets us to do as it wants. Yes, marketing techniques can sway us one way or another, but, in reality, the consumer is the puppeteer. We dictate what companies produce and sell, because, in the end, if we're not buying, they're not profiting. Our money is influential and can make a huge difference. Deciding what direction our food system goes is up to us, the consumers. —Ali Hammons



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Government Deception About GMOs

Ingredients from genetically modified (GM) crops now lurk in more than 80 percent of U.S. foods. A new book by Steven M. Druker raises grave doubts about their safety.

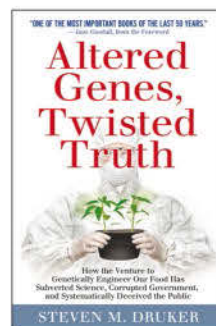
Wide swaths of U.S. cropland now host GM commodity crops. About 90 percent of the canola, corn, cotton, soybeans and sugar beets grown in this country are genetically modified to resist insects or herbicides, most notably glyphosate (sold as Roundup and other brands). These crops are used to make many popular foods, such as corn chips, baked goods, cereals and tofu. Many additives in processed foods are also now derived from GMOs. These include amino acids, aspartame, ascorbic acid, canola oil, citric acid, cottonseed oil, enzymes, natural or artificial flavors, high fructose corn syrup, lactic acid, MSG, soybean oil, sugar, xanthan gum, yeast, and more. Certified Organic foods, by federal regulation, contain no GMOs, but finding other foods without them is difficult because labeling GMOs isn't required in the United States.

Some zucchini, yellow summer squash and sweet corn, plus most Hawaii-grown papayas, are genetically modified, too. Earlier this year, the Food and Drug Administration (FDA) announced its approval of the new 'Arctic' apple and 'Innate' potato, varieties that are genetically modified to resist browning and bruising. In the past 20 years, this silent shift to GM crops has altered the very code of life and transformed our food system, a sea change the FDA continues to assure us is safe.

Not true, says Steven M. Druker in his book *Altered Genes, Twisted Truth* (available on Page 72).

Druker, a public interest attorney and founder of the Alliance for Bio-Integrity, has spent the past 15 years amassing evidence to show that GMOs aren't safe and should have never been approved by the government.

In 1998, Druker's organization and a group of life scientists and religious leaders sued the Department of Health and Human Services, challenging the FDA's 1992 ruling that allowed GMOs to enter the U.S. marketplace. The lawsuit argued that this policy is scientifically flawed and contrary to the FDA's own safety standards. Although the lawsuit lost on a technicality, the FDA was forced to hand over 44,000 pages relating to its GM food policy. "Those documents were a treasure trove," says Druker, who has compiled memos from FDA scientists revealing their opinion that GM food is significantly different from non-



GM food, that it entails higher risks, and that it can't be presumed safe without more rigorous testing.

Druker claims the FDA's failure began years before the first GM crop was cre-

ated, when biotechnology moved out of the scientific realm and became a political issue. So great was the sway of the genetic engineering establishment that it overpowered the FDA's own scientists, to the detriment of public safety. "A significant number of experts have always understood the risks, but they've been drowned out by those with government influence and money," Druker says.

With nearly 100 pages of footnotes plus a primer on molecular biology, Druker describes the dangers of GMOs, including the unpredictability of gene splicing. This process is not the same as conventional breeding, and it comes with unique risks that are inevitable when scientists begin altering complex systems. He documents how GM crops haven't led to reduced pesticide use and increased yields, as promised; how mainstream media outlets have failed to report the health and environmental risks of GMOs; and how respected scientists have been maligned or fired when their research found adverse effects of GMOs. The book is a chilling page turner about high-level deception, hubris and abuse of power. Druker's research shows why we can't trust the claim that "the science is settled" regarding the safety of the GM foods most of the public is now consuming, and, at the very least, why we should demand mandatory labeling so we can individually opt out of being guinea pigs in this grand experiment.

—Joanna Poncavage



U.S. food labels don't list which ingredients are GMOs.

Soy's Surprising Link to Obesity

Seldom does a story stand so starkly illuminated, boldly outlined by the lines of a graph. The focal point is a period in the mid-1960s, when forces aligned to launch the current obesity epidemic and a host of health problems in the United States. As you'll see, it was a perfect storm.

The data for this graph comes from an ambitious 2011 study published in the *American Journal of Clinical Nutrition*. Researchers posed a question fundamental to understanding modern health concerns, including diabetes, heart disease, obesity and mental health: How does our collective diet today differ from the common diet 100 years ago? The study examined consumption of 373 foods, but then went deeper by looking at how the composition of those foods varied over time, from 1909 to 1999. This latter detail—for example, how a modern chicken breast is different from its 1909 counterpart—turned out to be critical. Specifically, researchers examined fat consumption—not just fat in general, but the quantities of *particular* fats.

U.S. consumers eat
1,000 times more
soybean oil today than
they did 100 years ago.

An Era of Cheap Vegetable Oil

Despite what you may have heard, per capita fat consumption hasn't increased substantially in the United States throughout the past century. Per capita carbohydrate consumption has increased, however, causing low-carb advocates to cite this factor alone as the cause of the obesity epidemic. The data from the fat study doesn't contradict this hypothesis, but certainly refines the picture to pin at least some blame on the dramatic increase in our consumption of soybean oil, thanks to industrial agriculture's concentration on this single crop.

Myriad food sources provide dietary fats, from lard and butter—the mainstays of the Edwardian-era kitchen, when the study's data stream began—to margarine, canola oil, flaxseed oil and olive oil. Starting in the mid-'60s, what stands out—indeed, leaps off the graph—is the thousand-fold increase in per capita consumption of soybean oil (see chart below). No other food in the study comes even close to matching that explosion.

Partly this is because of the ubiquitous vegetable oils, made mostly from soy, that now lurk on grocery shelves and in processed foods. But it's also related to the way animals are raised. Today's industrially raised livestock, poultry and farmed fish are almost universally fed soybean meal and oil. Their feed's components are then found in the meat, milk and eggs sold to consumers. This study and others like it are explicit

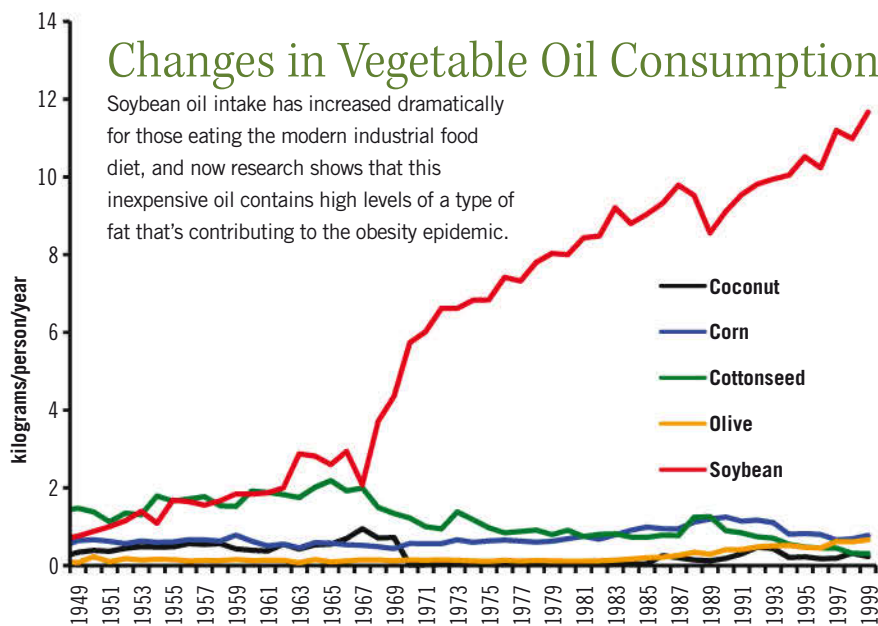
about this: Consumers get much of the soy in their diets secondhand from eating industrial meat, eggs and dairy products, as well as farmed fish.

Linoleic Acid: Omega-6 Overload

Why is this a problem? Soybean oil is very high in linoleic acid, an essential omega-6 fatty acid that is linked to obesity. Because we now consume a thousand times more soybean oil than we did a few decades ago, this means we're getting a much higher amount of linoleic acid. A diet that has a high omega-6 to omega-3 fatty acid ratio is linked to inflammation, but the evidence on obesity connects specifically to linoleic acid.

Nothing is inherently wrong with linoleic acid; it is, after all, an *essential* fatty acid. But it's problematic in excess. Feeding lab animals a diet in which 8 percent of their calories come from linoleic acid, a mirror of the modern U.S. diet, made them fat. Reducing their linoleic acid intake to 1 percent (in line with our ancestral diet), and replacing those calories with calories from other fats, made these same animals skinny again, like throwing a switch. Same amount of calories, same high-fat diet—but with different *kinds* of fats—and obesity reversed itself.

Yet even these studies may understate the long-term damage. A 2010 French paper moved the focus to epigenetics, the study of problems created by the behavior of one generation that are then passed on to the next. That study confirmed the role of linoleic acid in causing obesity. Researchers then bred the fat mice for several generations and found that the same diet made every succeeding generation fatter still. The results



revealed a cumulative effect across generations. (*Find links to all referenced studies in the online version of this article at www.MotherEarthNews.com/Linoleic-Acid. —MOTHER*)

Industry and Government Influence

How did we arrive at this excess of certain kinds of fats in our diets? Any Midwesterner can tell you that today's industrial agriculture really is, more specifically, the cultivation of corn and soybeans, most of which are genetically modified. The large-scale, mechanized, chemical-dependent system made popular by the so-called Green Revolution of the mid-20th century allowed farmers to grow monoculture commodity crops in enormous surplus. The trend began with cereal grains, but eventually U.S. corn and soy production skyrocketed. This created a massive increase in available carbohydrates and linoleic acid, which were cheaper than animal fats, such as lard and butter. Food processors switched from traditional animal fats to vegetable oils, and livestock farmers began including corn and soy in animals' rations. Both we and the livestock we raise for food were left with little choice but to eat up all that cheap linoleic acid.

Also in the '60s, the American Heart Association and the USDA recommended that we stop eating butter and eggs and switch to "heart-healthy" vegetable oils. Massive subsidies were put in place that still pay farmers billions of dollars annually to grow soybeans, corn and other commodity crops. Aggressive marketing campaigns persuaded us to eat products containing vegetable oils. All of this converged exactly when that line for soybean oil consumption took off in the graph of this key study, and the obesity epidemic began within a decade after that point. We have been victims in this complex interplay that's led to ill health. Only in recent years has the cover been lifted on the bad science about fats. We now understand that butter, lard, meat and eggs from pastured animals provide the kinds of omega-3-rich fat profiles that actually contribute to a healthful diet.

—Richard Manning



Much of our linoleic acid intake comes from eating meat and dairy products from industrially raised animals that are fed soy.



Financing solar, like this 2.5-kilowatt array, now has a homeowner's guide.

Solar Financing Guide

Have you considered going solar but found the various financing options confusing? To clarify your choices, the Clean Energy States Alliance (CESA), in cooperation with the U.S. Department of Energy's SunShot Initiative, prepared *A Homeowner's Guide to Solar Financing*. The guide outlines the ways to pay, including buying your system outright, solar loans and leases, and power purchase agreements (whereby homeowners contract with a third party to buy, install and maintain an array on their property). The cost of electricity from solar panels is now lower than the cost of retail electricity in many parts of the country, so you'll typically pay less on your monthly bill regardless of how you finance your panels. Check with your local solar installer to learn about state-specific incentives, but the CESA guide can get you started. Find it online at <http://goo.gl/24jjk6>.

—Kale Roberts

Homeopathy Hype?

Australia's National Health and Medical Research Council (NHMRC) released a report in March of this year stating that no reliable evidence exists to show that homeopathy is effective. Homeopathy is based on the premise that "like cures like." For example, a homeopathic practitioner may recommend a significantly diluted preparation of pollens to a patient suffering from pollen

allergies. The report, conducted by an independent contractor who studied 57 homeopathy reviews, as well as information submitted by homeopathy interest groups and the public, concluded that "there are no health conditions for which there is reliable evidence that homeopathy is effective. Homeopathy should not be used to treat health conditions that are chronic, serious, or could become serious." Read the full report at <http://goo.gl/a4kZNi>.

—Hannah Kincaid

Celebrate Soil

The fate of humans is inextricably linked to the soil that sustains us—yet we often regard it more as an inert medium than a symbiotic partner that's teeming with life. To bring more awareness to soil's significance, the United Nations declared 2015 the International Year of Soils (IYS). This initiative aims to convey the importance of soil for food security and ecosystems. Another objective is to promote investment in sustainable soil management activities for different land users and population groups. Head to www.FAO.org to learn more about the IYS, find a listing of events related to soil health, and browse a fact-filled FAQ that's sure to interest even the biggest soil nerds among us. We also recommend the film *Dirt!* for those who want to dig even deeper into this fascinating—and critical—topic.

—Shelley Stonebrook



STARS OF THE SUMMER GARDEN

*Cucumbers and Peppers
Take Center Stage*



Cucumber's cool crunch and pepper's crisp bite play complementary, crowd-pleasing roles that span early to late summer.

Story and photos
by Barbara Damrosch

Cucumbers and peppers shine in the summer garden, with different, though equally mouthwatering, roles. Cucumbers ripen in the temperate early summer, whereas peppers take their time and wait for late summer's warmth, especially in cool climates. Cucumbers are forever linked with the word "cool."

Peppers, in color and many in pungency, are emblems of heat.

During the weeks when their seasons overlap, cucumbers and peppers are often paired in the kitchen because they're both so refreshing and crisp when raw. Prized for color, flavor and texture, they shimmer when set side by side on the crudité platter, tossed together in a green salad, folded into a summer omelet, mixed in a spicy salsa, or combined in a classic gazpacho.

Cultivating Cukes

Cucumbers suffer somewhat from modernization. As shoppers, we're used to tough-skinned American slicers, which are bred for shipping, lack good flavor and are more palatable when peeled. Home gardeners have more flavorful options to choose from. Try the long Middle Eastern types, knobby little pickling cucumbers, or even twisted Armenian varieties. I like growing the prolific 'Socrates' in the greenhouse, and





Chunky Gazpacho

Spain gave us this ever-popular summer soup, which is light and fresh-tasting, but with a bit of zing—or a lot of zing, if you like your food spicy. Every gazpacho recipe is a little different. I leave its crunchy ingredients large enough to give it texture, and to let the various colors play against one another—much more appetizing than a purée of red and green vegetables that, mingled too intimately, produces a dull brown. Stir in the olive oil, because blending will dull the dish's color. I like a strong note of citrus in this cold soup, countered by a bit of sweetness. Float the crunchy mix on top so you can see it and stir it in bit by bit. *Yield: 4 to 6 servings.*

Directions: Wash the tomatoes and slice off the stem ends. Set in a bowl and pour boiling water over them to loosen their skins. Slip off the skins and discard. Place the tomatoes in a blender or food processor along with the agave syrup, lemon juice, lime juice, salt, black pepper, onion and garlic. Pulse briefly until just smooth. Pour into a pitcher, gently stir in the olive oil, and refrigerate.

Peel the cucumbers, cut lengthwise in quarters, and scrape out any seeds. Cut into small dice and set aside in a bowl. Remove the stems, seeds and ribs from all the bell peppers, and then cut them into small dice as well. Finely chop the jalapeño. Add the peppers to the cucumbers, toss to combine, and refrigerate.

When ready to serve, give the tomato mixture a thorough stir and pour into individual bowls. Top each serving with the mixture of cucumbers and peppers, and then sprinkle on the cilantro. Save any leftover cucumber/pepper mix, chilled, to top green salads.

Ingredients

- 2 pounds red, ripe, juicy tomatoes
- 2 tbsp agave syrup or raw sugar
- Juice of 1 lemon
- Juice of 3 limes
- 1 tsp salt
- Freshly grated black pepper
- 1 tbsp minced onion
- 2 cloves garlic, minced
- ¼ cup extra-virgin olive oil
- 2 medium-sized cucumbers, about 1 pound
- ½ each red, orange and yellow bell peppers
- 1 jalapeño pepper, or to taste
- 2 tbsp chopped fresh cilantro



sowing the Japanese cucumber called 'Tasty Jade' in our outdoor home garden.

As with most fruiting crops, cukes need a sunny garden spot. Plant in warm soil after danger of frost is past. Sow seeds directly, or set out transplants that are no more than 3 weeks old. Trellising is a must. The best cucumbers grow on vines and would require an irresponsible amount of space if left to sprawl. Try growing them on a tall lattice fence, or on a homemade trellis built from a wooden or metal-pipe frame. You can also rig up metal or nylon mesh for a trellis, or just let the vines climb up lengths of string. The vines will want to reach upward, holding onto whatever they find, but plastic tomato trellis clips will keep the unruly plants tidy. Give the plants steady moisture. If cucumber beetles show up, remove them with the crevice tool attachment on a cordless shop vacuum—suck them up early in the day while they're still sluggish.

Culinary Cukes

Cucumbers are cherished for crunchiness, whether eaten in a sandwich with watercress and mayo; put into service as a canapé "cracker"; or folded into protein-based salads made with shrimp, lobster, tuna, chicken or hard-boiled eggs. Nothing stretches these salads better than cukes when unexpected guests sit down at your table. A platter of sliced cucumbers is a great last-minute dish to take to a potluck, mixed with a few sliced onions, green herbs such as dill, and vinaigrette or—better yet—plain yogurt and sour cream. Or, toss a cucumber and some buttermilk into your blender for a quick, cold soup. The best way to store cucumbers for winter eating is to ferment or can them into pickles.

Did you know you can cook cucumbers, as well? Despite their high water content, cucumbers keep their firmness surprisingly well when heated. Try simmering them with onions, and then blending them with chicken broth and cream for soup. Or, sauté them with cumin, as in the recipe on Page 18. I once cooked cukes for a cucumber-hating friend who wolfed down every bite—he thought they were zucchini.

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Pick a Pepper

An ancient New World crop, peppers are now popular worldwide and astonishingly varied. Page through a specialty catalog, such as that of Redwood City Seed Co. (www.EcoSeeds.com), and you'll see what I mean.

Try different varieties each year, especially if you enjoy experimenting with exotic cuisines. Hot pepper types are often associated with a specific region in which they are grown, and its accompanying cuisine. This is quite obvious with the peppers of Thailand, say, or Mexico.

But it took a trip to Italy's Piedmont to open my eyes to the range of sweet peppers that carry the names of the towns that made them famous. I fell in love with the renowned 'Carmagnola Rosso' peppers of Carmagnola, a town just south of Turin, so delicious in a *peperonata* (sweet peppers stewed with onions, tomatoes and garlic). I also loved the blocky 'Quadrato d'Asti' and



From long and skinny to nearly spherical, chiles come in all sizes, shapes and Scoville heat units.

the pointed ones shaped like a bull's horn ('Corno di Toro'). Seeds from Italy (www.GrowItalian.com), the catalog that represents the famous Franchi seed line in the United States, is a good source for these and more.

I try to plant some peppers that are sweet, some that are very hot, and some that are in between. Chile peppers have

their quirks: Some take a long time to acquire their heat ('Havasu' comes to mind) and there's one with a Russian roulette effect (the little 'Padron'), where only one in 20 fruits will be hot. Some chiles have different names at different stages. Poblanos become anchos when matured to red and then dried (though I've seen them sold as anchos



Warm Cucumbers with Cumin

Cucumbers take on a new personality in this dish with Indian spices—cumin for fragrance and flavor, and turmeric for its warm golden color. As side-dish recipes go, these cucumbers pair well with meat and fish, but could also be a light meal alongside rice and topped with a dollop of plain yogurt. *Yield: 4 to 6 servings.*

Directions: Cut the onions into quarters, then into 1/4-inch slices. Cut the cucumbers into 1/4-inch slices, discarding the tips. Melt 2 tablespoons of the butter in a large skillet over medium-low heat and add the onions, cucumbers and a pinch of salt. Stir for 1 or 2 minutes, and then cover for 5 minutes, sweating the vegetables and making sure they don't burn. Remove the lid and continue to sauté, stirring frequently, for about 10 minutes more, or until the vegetables are just tender. Reduce heat to low and keep warm.

In a small saucepan, melt the remaining 2 tablespoons of butter over low heat and add the cumin and turmeric. Stir continuously to cook the spices and bring out their flavor. Add to the vegetables and stir to coat them thoroughly. Season with black pepper and serve warm with rice. Pass a bowl of whole, plain yogurt if desired.

Ingredients

- 2 medium onions, peeled
- 2 long, skinny cucumbers, unpeeled, about 1½ pounds
- 4 tbsp butter, divided
- Pinch of salt
- 2 tsp ground cumin
- 1 tsp ground turmeric
- Freshly ground black pepper

YOUR NEW

- SECRET WEAPON -

IN THE KITCHEN



COOK

Add into delicious savory dishes, sauces, marinades and dressings.



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BAKE

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when still green); jalapeños become chipotles when ripened, smoked and dried.

I used to grow the “ornamental” types of peppers from time to time, some of which are bred to perch on the tops of the plants’ branches. But it makes little sense to plant a pepper for its appearance rather than its taste, because all peppers are great to look at in the garden.

Peppers need a warm start, so gardeners usually sow them indoors to get a jump on the season. Pick off the first flush of blossoms to encourage plant growth. Give the plants ample water and fertile soil, but not excessive nitrogen, which will encourage vegetation at the expense of fruit. You needn’t trellis peppers in a home garden because the plants are neither tall nor vining, but a bumper crop can sometimes topple a plant. For support, tie each plant to a bamboo stake poked into the ground next to the stem, or use the wire frames commonly sold as tomato cages. As with cucumbers, peppers are best harvested with snips or a sharp knife. Pulling the fruits off may injure the plant.

Peppers shine in cooked dishes, whether stuffed and fried, stuffed and baked, fried in hot oil, tossed into a curry, or roasted and then turned into a creamy soup or dip. They are also among the easiest vegetables to dry. String chiles up or lay them out on newspaper in any warm spot in the house. Store dried peppers in the dark to preserve their color. I’m apt to pulverize dried peppers in an electric coffee grinder to create home-made paprika or chile powders. 🌱

Barbara Damrosch and her husband, Eliot Coleman, own Four Season Farm in Harborside, Maine. Preserved hot chile peppers keep their meals lively during Maine’s long winters. She is the author of *The Garden Primer* and, with Coleman, of *The Four Season Farm Gardener’s Cookbook*. Both are available on Page 72.



Chiles Rellenos

The name of this classic Mexican dish translates into “stuffed peppers,” and one of the most popular versions involves stuffing poblano peppers (which are mildly hot) with a semi-soft, mild cheese, such as Monterey Jack. Often, chiles are dipped in an egg batter first, as in this recipe, but you can omit this step for a lighter dish. You can also bake them with a little olive oil instead of frying them. This makes enough batter to coat 8 large peppers; if yours are smaller, you can adjust the amount of batter accordingly.

Making chiles rellenos is neither a quick nor tidy process, but the result is a crowd-pleaser. I like them served with rice. *Yield: 8 servings as a side dish, 4 as a main course.*

Directions: Cut the stem ends off the peppers and, using your fingers, carefully pull out and discard their ribs and seeds. Wear gloves if the peppers are spicy. Then, peel the peppers by first exposing them to high heat to make them blister. Peeling will help the batter adhere, remove the bitterness that poblano skins sometimes have, and add a pleasant hint of charred flavor. You can blister them in various ways: by placing them on a grill and turning them often, by holding them with tongs over a gas stovetop flame, by searing them in a skillet with a little olive oil, or by placing them directly under a hot broiler. They’ll make a popping noise as the dark blisters appear. Take care that the flesh doesn’t burn. Place them immediately in a paper bag and close it tightly so the peppers will sweat. This will make them easier to peel, and will help soften them for stuffing.

After about 20 minutes, remove the peppers and rub the skins off. Rinsing will help remove the skin, but let the peppers dry a bit before stuffing. Don’t worry if some skin remains. Cut the cheese into small logs and insert some into each pepper through the hole in the top where you removed the stem end.

Separate the eggs. Beat the whites until stiff peaks form, and whisk the yolks. Fold the yolks gently into the whites, and then fold in the flour. Heat the olive oil in a medium skillet big enough to hold 2 or 3 peppers. When it’s hot, dip the peppers in the batter—best done with your fingers—coating them as evenly as possible. Drop them into the hot fat in small batches and fry until golden-brown on both sides. Drain on parchment paper or a paper plate, and then arrange on a hot platter. Sprinkle with salt.

Serve hot, with Tabasco or your favorite hot sauce passed at the table.

Ingredients

- 8 poblano or other mild-to-medium chile peppers
- ½ pound Monterey Jack cheese
- 6 large eggs
- 1 cup whole-wheat flour
- 1 cup olive oil
- Coarse salt, to taste
- Tabasco sauce, to taste

DIG DEEPER! If you want to chill out with cukes, perk up with peppers, or learn more about how to grow other captivating culinary crops, visit our Crops at a Glance Guide at www.MotherEarthNews.com/Crops-At-A-Glance.



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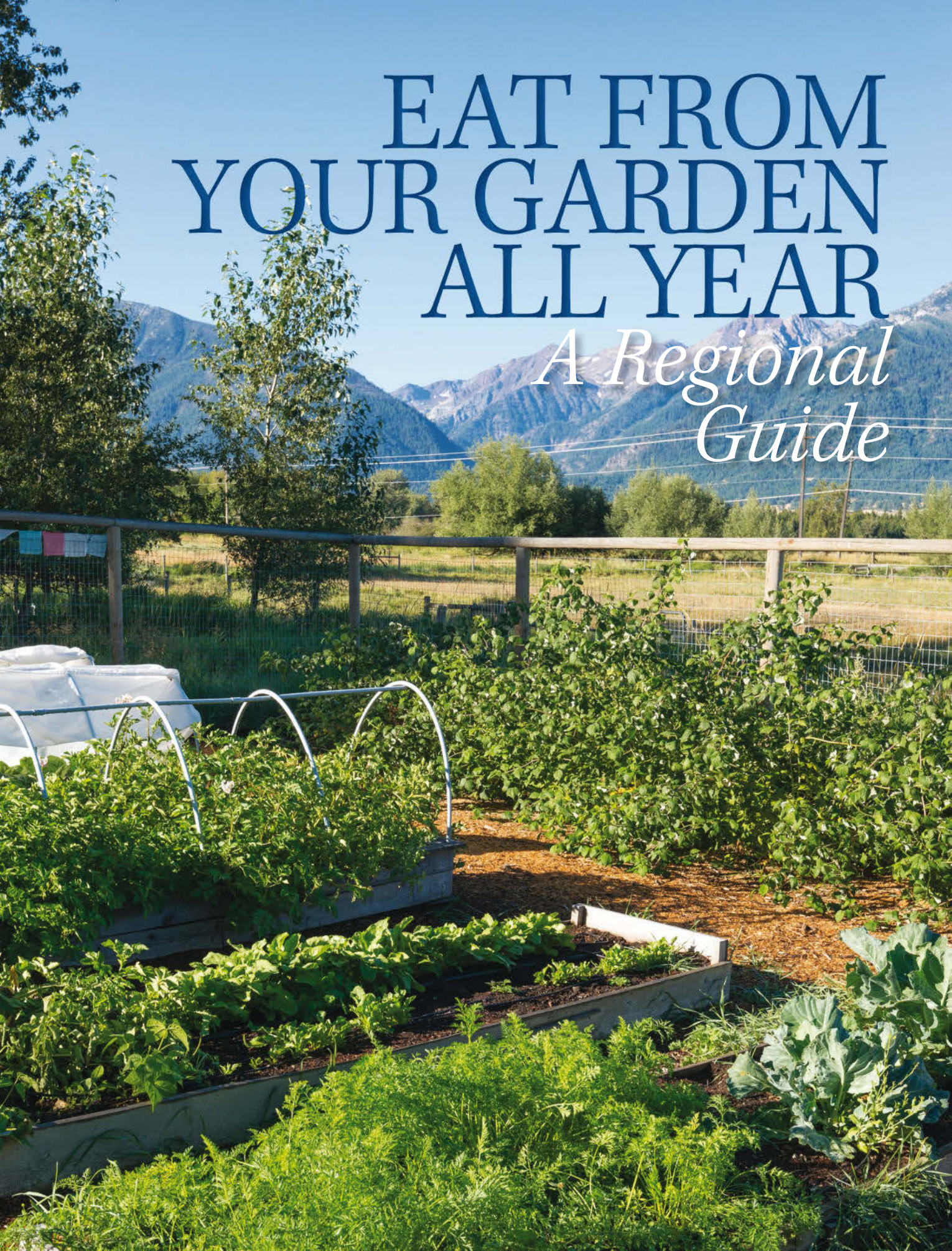
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Circle #18; see card pg 81

EAT FROM YOUR GARDEN ALL YEAR

*A Regional
Guide*



With these expert-recommended techniques and crop varieties, you, too, can break through seasonal barriers in your climate.

By Vicki Mattern

Fall frost doesn't have to spell the end of garden-fresh eating. By choosing the right crops and varieties, as well as implementing some crop-protection strategies, you can push the seasonal envelope much further than you might have imagined. We talked with 11 of the most adventurous and successful gardeners we know from coast to coast (see map, Page 24) to learn their top tactics for stretching the growing season to its max. Try tips from in or near your Plant Hardiness Zone or region to embark on eating from the garden year-round!

Pacific Coast

1 Salt Spring Island, British Columbia (Zone 8). Linda Gilkeson, entomologist and author of *Backyard Bounty*, overwinters frost-tolerant varieties of kale, carrots, beets, leeks, purple sprouting broccoli, cauliflower and Brussels sprouts, as well as many other healthful greens. "They're all still going full-tilt come March," she says.

From late February into May, cold-hardy cauliflower ('Aalsmeer,' 'Galleon' and 'Purple Cape') and broccoli ('Cardinal,' 'Red Spear' and 'White Star') produce crops from seed sown in late June to early July the previous year.

"Celeriac, grown for its flavorful roots, is a midwinter delight. Just leave it in the garden, well-mulched," Gilkeson advises. You can do the same with carrots and beets. For your leafy greens, keep a sheet of heavy plastic on hand, which you can prop aloft above your beds with stakes or low hoops to provide protection from Arctic blasts.

2 Corvallis, Ore. (Zone 8). Carol Deppe, plant breeder and author of *The Resilient Gardener* and *The Tao of Vegetable Gardening*, overwinters many crops, including kale, beets, purple sprouting broccoli and edible-podded peas. But her favorite way to eat from the garden year-round is to pack her pantry with reliable storage crops, such as homegrown grain corn, dried beans and winter squash.

For polenta and cornbread, Deppe likes 'Cascade Ruby-Gold' flint corn, an early maturing, cold-hardy variety she developed. She recommends 'Magic Manna' flour corn for cakes, pancakes, sweet breads and parching. A quality coffee grinder or blender can grind flour corns into a fine flour similar to wheat flour in texture. Deppe's favorite dry beans for her area are 'Gaucho' bush (an Argentine heirloom) and 'Black Coco.' She suggests timing the plantings so the pods can dry on the mature plants in late August, before fall rains.

Her favorite winter squash for the Northwest is 'Sweet Meat—Oregon Homestead,' which produces sweet, dry, flavorful fruits weighing up to 25 pounds. She also grows and stores 'Candystick Dessert Delicata,' 'Delicata Zeppelin' and 'Honey Boar' winter squash. All produce small, striped fruits with fine-grained, sweet, dry flesh, and will keep through late December. The fruits of 'Candystick Dessert Delicata' can weigh up to 3 pounds and have thick flesh with a flavor reminiscent of a Medjool date. Winter

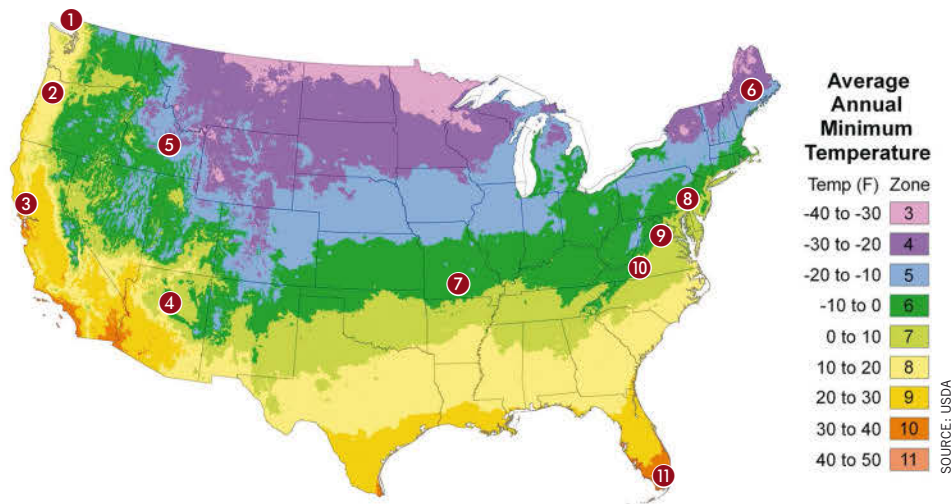
squash generally bear large fruits that keep well and become more flavorful in storage. "Let them cure while you're eating up your fall veggies, and then eat your long-keeping *Cucurbita maxima* and even-longer-keeping *C. moschata* varieties," Deppe says.

Just as some Native American tribes did, she slices and dries summer squash for winter use, too. Through extensive testing, she found 'Costata Romanesco' and any gold zucchini best for both eating fresh and drying. Just cut 3/8-inch slices of 1- to 3-pound fruits that have tender skins and small, immature seeds. Although she dries squash on a rack modeled on one that native tribes used, you can employ a food dehydrator set at 125 to 140 degrees Fahrenheit. The whole dried slices reconstitute in soup when cooked for about 45 minutes; chop up the dried slices first for faster cooking.

3 Palo Alto, Calif. (Zone 9). In her coastal garden, Rosalind Creasy, author of *Edible Landscaping* and many other books, grows peas, scallions, onions, lettuce, kale, radishes, cauliflower, cabbage, broccoli,



Winter haul: A Zone-8 gardener's New Year's harvest of leeks, cabbage, root crops and leafy greens.



From the cool Northwest to tropical Florida, gardeners in several USDA Plant Hardiness Zones offered tips for this article. Warming global temperatures have been pushing Zones farther north over time.

Asian and mustard greens, chard, beets, parsnips, carrots, fava beans, and wheat through winter. Beets and chard planted in late October have the added advantage of avoiding the leaf miners that often plague these crops in summer. The cooler temperatures are also ideal for cilantro. “Most people try to plant cilantro in summer, but it bolts,” she says. “If you plant it in September, it will produce through winter and flower in March, attracting beneficial insects to the garden.”

She rarely needs cloches or row covers for frost protection. “To protect my frost-sensitive citrus trees, I hang old-fashioned white Christmas lights in the trees. They give off just enough heat to prevent the trees from freezing and look very pretty.”

Creasy preserves her garden’s summer flavors in her signature minestrone soup and her apple, tomato, marinara and ran-

chero sauces, which she freezes for winter use. Her frozen treasure trove also contains savory roasted tomatoes, herbs in olive oil, blackberries lightly dusted with sugar, chopped basil layered with Parmesan cheese, and lime juice cubes.

Southwest

4 Cornville, Ariz. (Zone 8). Native American corn and bean varieties are ideally suited to the hot, dry conditions of the Southwest, says Bill McDorman, founder of Seeds Trust, which began in Idaho but has been headquartered in Arizona since 2005. Many varieties McDorman grows and recommends have been selected over many generations for their ability to thrive in the region’s harsh environment. He harvests grain corn into November, and then stores it for use through winter and early spring. He recommends ‘Rio Grande

Blue,’ a flour corn that’s ideal for tortillas. “Dry the corn on the stalk before you pick it. If it isn’t completely dry, peel back the husks to let it finish drying,” he suggests. “Don’t shell the kernels from the cobs until you’re ready to use them. That’s the secret—it makes an altogether different food from what you’d get at the store.”

‘Candy Mountain,’ an early, open-pollinated variety with rich flavor, is his favorite sweet corn. Its strong emergence in cool soil and its early season vigor make it a standout for the Southwest and many other high-altitude locales. Among beans, McDorman favors what are now known as “Anasazi”—a type of bean believed to have originated from seed found in a clay pot among ancient ruins of ancestral Pueblo people. “The beans store for up to 10 years, cook relatively quickly, and have a creamy texture and rich flavor,” he says. He also considers tepary beans (*Phaseolus acutifolius*) a regional gem. Native groups in Arizona and northwestern Mexico grew and selected these beans to thrive there. Tepary beans need a short season (60 to 80 days) and are drought-tolerant.

McDorman harvests fresh Jerusalem artichokes, oregano and garlic through winter. Plus, he’s never without greens: “Wild mustard grows in the shade of mesquite trees everywhere around this part of the Southwest. So, I plant ‘Slow Bolt’ arugula, a relative of mustard, near mesquite. I get an unlimited supply of fresh greens for several years without replanting.”

Northern Tier

5 Ketchum, Idaho (Zone 5). Bill McDorman is also well-acquainted with the extremely cold, short growing season of the North. He began his seed company, Seeds Trust, in Ketchum, Idaho, to help meet the needs of gardeners dealing with that region’s challenges. He suggests starting seeds indoors, and also taking advantage of warm microclimates, such as an area at the south side of a building with a concrete foundation. Try adding rocks to garden beds to increase thermal mass. “Or, site the garden on a south-facing slope,” he says. “The soil will start to warm about three weeks earlier in spring.”

Gardeners in this climate can grow kale and Brussels sprouts well into fall and



Can, freeze or ferment your summer harvests to stretch them into fall and winter meals.



Bend hoops over beds to easily add and remove row cover when needed.

early winter if snow cover is good, he says. 'Dwarf Siberian' kale, selected to stay low under the protection of snow, is a favorite. He also notes that many gardeners plant crops relatively late in the year and try to get them to mature as temps are dropping, which is rarely successful. Instead, focus on planting in time for crops to mature right before the first fall frost, and then use protection devices to keep them going.

To give corn a two- to three-week head start in spring, McDorman says, sow the seeds in the bottom of a 1-foot-deep trench, cover them with a couple of inches of soil, and then roll plastic over the top to trap the heat and moisture. When the corn reaches the plastic, around your last spring frost date, remove the plastic and fill in soil around the growing plants.

McDorman also urges gardeners in cold, short-season areas to grow Siberian tomatoes. In 1989, he collected seeds of 60 Siberian varieties that are now world-famous for their hardiness and flavor. "They were selected for the very best flavor by the gardeners who grew them and then traded the seeds," he says. All are cold-hardy, but many tolerate hot temperatures, too. 'Mikarda Sweet' and 'De Barrao' are good Roma types for stor-

age. And because all the Siberian tomato varieties are open-pollinated, you can save your own seeds and develop the best strains for your microclimate.

6 Waterville, Maine (Zone 5). Fedco Seeds horticulturist Roberta Bailey harvests brassicas, carrots, beets, cilantro and spinach well after her first frost, using high tunnels and row covers. 'White Russian' kale has held in an unheated greenhouse all the way down to zero degrees, and survived in the garden until January beneath insulating snow. Gardeners in the area can also grow 'Vates' collards, 'Green Lance' gai lan (a Chinese kale used like broccoli), and yokatta-na (an extra-hardy Asian green similar to bok choy) beneath row covers. "If snow cover is constant, 'Kolibri' kohlrabi, parsnips and horseradish will survive winter, too," Bailey says.

Central

7 Mansfield, Mo. (Zone 6). The Midwestern area has a longer growing season than its northern neighbors, but frost-free dates can vary widely from year to year. The growers at Baker Creek Heirloom Seed Co. use row covers, cloches and cold frames to protect cabbage, lettuce and other greens from

damage in spring and fall. They recommend 'Wong Bok' Chinese cabbage, as well as the heading cabbages 'Early Jersey Wakefield,' 'Red Express,' 'Cour di Bue' and 'Late Flat Dutch.' Tatsoi, bok choy, collards, arugula and 'Giant Red Japanese' mustard also thrive.

"For storage, try 'Pusa Asita Black' and 'Atomic Red' carrots, and 'Chioggia' and 'Golden' beets," says spokesperson Kathy McFarland. "Also, 'Blue Hubbard,' 'Galeux d'Eysines,' 'Mini Red Turban' and 'Moranga' (also called 'Pink Pumpkin') squash will keep all winter long."

Mid-Atlantic

8 Devon, Pa. (Zone 7). Contributing Editor William Woys Weaver grows mustard, lettuce, and celeriac beneath tunnels covered with greenhouse-grade plastic. He says the key to overwintering vegetables is to plant early enough for the crops to develop a good root system. If planted by early September, lettuces will develop sufficient roots so they can survive winter and, by early April, will be growing strong again.

Turnips, parsnips, winter radishes and 'Green Glaze' collards have proven exceptionally hardy, easily surviving winter

without protection. Weaver grows several less-familiar edibles in large tubs inside an unheated greenhouse in fall and winter. Oca, an Andean vegetable, produces a bumper crop of brightly colored, waxy tubers by mid-January. Yacon, a Jerusalem artichoke relative also native to the Andes, produces crunchy, sweet, nutritious tubers. Weaver also overwinters the South American litchi tomato in tubs inside his greenhouse, and then replants them in his garden when the weather warms in spring.

9 Warrenton, Va. (Zone 7). Homesteader and author Harvey Ussery is wild about chicories for cold-weather salads: “There’s a huge diversity of types—escarole, endive, radicchio and sugar loaf—and they bear beautiful leaves of pink, rose, salmon, green and white. They’re much better than a lettuce salad, to my taste.”

Most brassicas don’t appreciate the area’s hot, late summers, although ‘Vates’ kale, a few Asian greens, and turnips are dependable exceptions. Instead, Ussery focuses on growing fall and winter storage crops. Dense-fleshed root crops, such as carrots, turnips, rutabagas and beets, keep best (and stay sweetest) right where they grew, beneath a thick layer of clean straw or leaves. Just kick aside the snow and mulch to dig your crops.

A “clamp” is another easy winter storage method for rutabagas, turnips and cabbages, Ussery says. In fall, dig a hole below the frost line, put in your unwashed vegetables, and cover: “I make my clamp 2 feet deep. I cover it with 2-by-4s, a sheet of plastic, and a couple of straw bales.” This old-fashioned method maintains a high humidity level, so the veggies will stay crisp.

Indoors, Ussery stores winter squash, dried corn, peanuts, onions, garlic, potatoes and sweet potatoes. “The queens of storage squash are the *C. moschata*

varieties. I especially like ‘Seminole,’ which has an incredible ability to last, and resists squash vine borers.” He also highly recommends ‘Tennessee Red Valencia’ peanuts, which tolerate clay soil. After harvest, he cures the peanuts for about a month in an airy place, and then stores them through



‘Atomic Red’ carrots, ‘Purple Cape’ winter cauliflower and ‘Chioggia’ beets stand up well to cold growing conditions.

winter. “We roast small batches for about a half-hour, shell and eat—delicious.”

10 Floyd, Va. (Zone 6). Author and expert organic gardener Barbara Pleasant grows spinach and parsley inside a glass-topped cold frame through winter, and

overwinters onions and ever-bearing strawberries beneath row cover supported by sturdy wire cages. To encourage strong germination of radishes, beets and carrots in cool spring soils, she lays row cover directly over a seeded bed at ground level, just until the crop germinates. She then installs the cover over hoops so the tiny seedlings don’t have to bear the weight of the cover.

For storage, Pleasant succeeds with dry beans, pumpkins, winter squash, potatoes and sweet potatoes. She especially likes ‘Dickinson’ pumpkins. Instead of growing storage onions, she says local gardeners should try shallots, which are often easier to grow and superior keepers.

Tropical South

11 Homestead, Fla. (Zone 10). “Don’t mistake this as the southern United States,” says Andres Mejides, gardening instructor and owner of Elfin Acres organic farm. “It’s the northern Caribbean!” Gardeners here can simply walk out their back doors and gather whatever happens to be ripe, year-round. “What it boils down to is the topsy-turvy nature of when to plant,” he says. “Winter is for crops that gardeners in other regions would grow in summer. We can start tomatoes and peppers in late summer, and then proceed through December with cool-weather crops, such as broccoli.”

Mejides notes that, without an extended cool season, getting a good crop of peas is difficult. He suggests growing perennial pigeon peas instead. He also advises waiting until the rainy season ends in mid-October to plant cucumbers and squash, to reduce the chance of foliar diseases. When the weather warms in spring, switch to crops common in the tropics, including chayote squash, okra, malanga (a starchy root vegetable), yuca root, boniato and tropical fruits. 🌿

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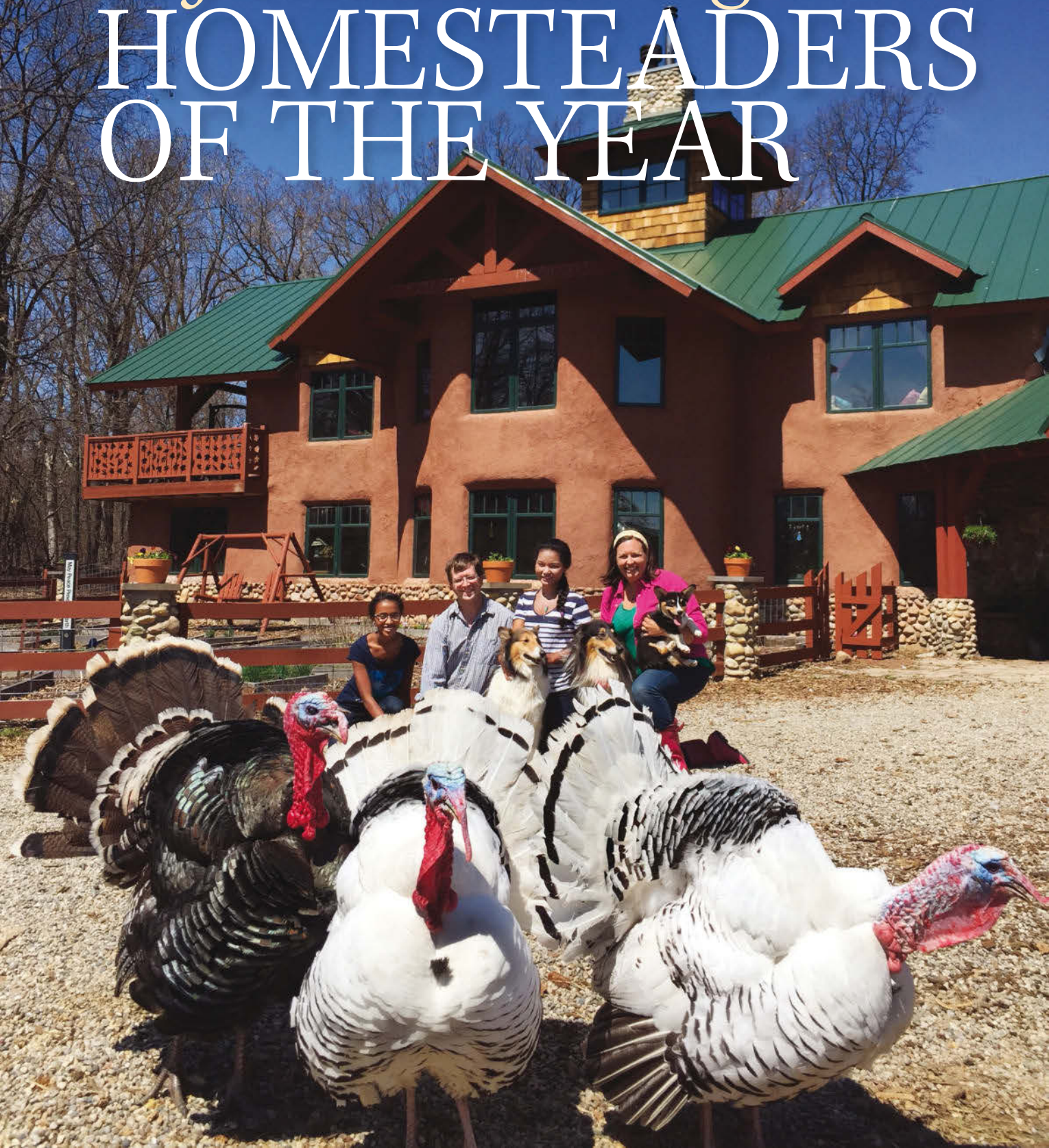
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Circle #36; see card pg 81

*The Many Paths to
Self-Reliant Living*
HOMESTEADERS
OF THE YEAR



Living off-grid, raising heritage livestock, growing stunning gardens, and packing their pantries are just some of the activities that make these modern homesteaders absolute standouts.

By Jennifer Kongs

We are thrilled to feature four inspiring families as our 2015 Homesteaders of the Year. Their homesteads range from 2½ to 120 acres, but each family has adapted its activities to match its resources. Through self-reliant living—combining off-homestead jobs with homestead-based businesses, producing off-grid power, raising and growing food, and finding ways to save money—these families have achieved happiness and security on small budgets. Following are interviews and snapshots of each family. You'll find longer interviews and more photos, plus stories from other star modern homesteaders, at www.MotherEarthNews.com/Star-Modern-Homesteaders.

Heritage Homestead

Who: Joe and Shelly Trumpey, with daughters Autumn and Evelyn.

Where: Near Grass Lake, Mich., since 2009.

What: Sandy Acres Farm is 40-plus acres stocked with heritage-breed livestock. The Trumpeys live off the grid in their hand-built straw bale home, and they produce at least half of their own food by gardening, canning, freezing, and raising animals for meat and eggs.

Homestead-based income: The family sells wool, meat and eggs on-farm and to family and friends.

Off-homestead employment: Joe is an associate professor of art and natural resources at the University of Michigan, and Shelly is a third-grade teacher.

Find them online: www.JTrumpey.com/Project/Sandy-Acres-Farm

You have a lot of heritage animals—tell us about your livestock.

We raise a flock of about 50 Jacob sheep, and we shear the sheep ourselves and butcher a dozen or so each year. Our Highland cattle herd includes a bull, plus three cows and their calves. We have one bull butchered every 18 months, and we eat about a quarter-beef each year.

We have about 25 laying hens of various breeds, of which Welsummers and Wyandottes are our favorites. We raise about 40 roosters to butcher each year, as well as a small number of Royal Palm and Standard Bronze turkeys and a few ducks. We keep Mulefoot hogs, a dozen or so American Chinchilla rabbits, and two beehives that provide about 3 gallons of honey annually.

Our cattle, pigs and some of the lambs are butchered locally. Joe does the rest of the butchering on-farm. We produce 100 percent of the meat and eggs we consume, and we sell or trade all excess animal products with friends and family. We feel great about our animals' quality of life and consider our production of ethically grown, pastured meats one of our greatest successes.

What do you do with all that wool? Do you all own a complete rainbow set of sweater vests?

We all spin, and Shelly uses the yarn to knit sweaters, scarves, hats, socks and mittens for the family. She also sews and stuffs wool quilts, pillows and comforters. We also sell roving.

Describe your system for living off the grid.

We have a 4-kilowatt (kw) tracking array, and 15 SunPower solar panels mounted 25 feet high on a dual-axis tracker. The power is stored in 60 golf cart batteries. A custom-built, 8-kw inverter runs our high-voltage system. We have a small 2½-kw gas generator that charges our batteries during stretches without sun. The inverter, panels, tracker and batteries cost about \$34,000.

We harvest wood from our property to heat the house and water. Our Froling wood gasification boiler provides hot water for our domestic use and radiant floor heat. We also cook and heat with a Heartland wood-burning cookstove during winter. A solar thermal panel heats our water in summer. We haven't burned a drop of fossil fuel to heat the house or water in three years.

We "culturally adapt" to our available power: Just as we eat seasonally, we also use power seasonally. We monitor our energy use every day, and we know we can run out just as we can run out of milk or potatoes.



The Trumpeys built their off-grid home (left) and raise Highland cattle, Jacob sheep and other heritage breeds.

Your straw bale home is impressive. How did you build it?

We spent about seven years researching and planning. After we purchased our 40 acres, we passed three years exploring the property. We began by erecting a 30-by-60-foot pole barn to house equipment and straw while building our home. When we were about to start construction, wood from our county was put under quarantine because of the emerald ash borer, so we were able to salvage free logs for our house. We purchased a Norwood mill, and Joe milled lumber over the course of a year. Then, we worked every single day on actually building the house—after school, on weekends—for two years. We reached moments of exhaustion and frustration, but they were worth it.

A few highlights: We gleaned stone from our pastures to construct a stem wall to protect the straw from snow and rain. We installed 4,000 feet of radiant floor tubing in the floors, compressed 800 straw bales to form our walls, and mixed and spread about 80 tons of adobe plaster.

The house is 2,200 square feet, and the workshop, animal room and guest room add another 900 square feet. In the end, we completed all the work, including the solar system, for about \$75 per square foot. We financed the home, land and solar system through a local farm credit union.

The Bees' Knees

Who: Robert and Jaime Cool, with daughter Norah.

Where: Edgemont, N.C., since 2006.

What: Bee Kind Family Farm is a 2½-acre off-grid homestead in the Pisgah National Forest that specializes in producing honey and related products. The family raises 70 percent of its food.

Homestead-based income: Via local farmstands, the Cools sell honey, hives, produce, shiitake mushrooms, eggs, chickens, soap and candles. These sales accounted for nearly \$9,000 last year. Jaime also sells homemade soaps and candles online.

Off-homestead employment: Robb works full time as an inn's maintenance tech.

Find them online: www.BeeKindFamilyFarm.Etsy.com



The members of the Cool family keep busy inspecting their off-grid solar system and the bees they raise for honey in hand-built hives.

Describe a general day in the life at your homestead.

Our lifestyle makes us constantly aware of the weather. Different seasons require different chores, but no matter the season, most everything we do revolves around the weather. We're surrounded by 192,000 acres of forest; it's a haven for our honey bees, but we're quite isolated and must look out for ourselves.

During winter, we get up by 6 a.m., start a fire, feed and water the chickens, and haul more wood into the house. Robb goes to work, and Jaime drives Norah to school and then spends the day baking, handling household chores, cooking on the wood cookstove and sewing. In the evenings, Robb builds hives, puts together bee frames and takes inventory of bee equipment. In early spring, Jaime starts seeds, readies garden beds for planting and transplants seedlings. By late spring, she's busy weeding, harvesting, bottling and labeling honey, handling online sales, making soap—the list goes on! Robb makes hives to sell and is in the bee yard every spare moment inspecting hives and rearing queens. He begins pulling honey in early summer. Fall is bustling, too, with Jaime canning garden bounty and planting late-season

crops. Robb regularly hauls and splits wood. We burn about 11 cords in winter. It's a busy, yet rewarding, life.

Busy, indeed! You mentioned sewing; do you sew clothing?

For 15 years, Jaime had an online business called Backporch Boutique, where she sold handmade hemp and organic cotton clothing. She still sews for our family. The majority of our clothing comes from Goodwill. We're serious secondhand shoppers.

Can you describe your off-grid setup?

We've been living off the grid for two years with a system we installed ourselves. We have nine 240-watt solar panels, a 2,500-watt inverter, a charge controller and 12 deep-cycle batteries. We heat our home entirely with wood, and in winter we also cook



on, bake in and heat water with our wood cookstove. We pay \$40 each year for a permit to harvest dead trees from the Pisgah National Forest, which allows us an unlimited supply. Through the summer months, we use a homemade solar hot water collector and a fantastic outdoor solar shower. We're free of power, water, heat, sewer, garbage, cable and cellphone bills.

Clean Living

Who: Matt and Jennifer Eby, with children Kathryn, Lauren and Henry.

Where: Cassopolis, Mich., since 2011.

What: Eby Farms covers 36 acres and is home to sheep, chickens and cattle, all of which provide products the family consumes and sells.

Homestead-based income:

Through farmers markets, craft shows, and on-farm and online transactions, the family sells homemade soap and body care products, and meat and eggs from their animals, all of which adds up to approximately 70 percent of the family's yearly income.

Off-homestead employment: Matt works a part-time construction job that provides 30 percent of the household income.

Find them online: www.EbyFarmsLLC.com

What are your favorite parts of your homestead?

Our biggest project was the 14-month remodel of our 900-square-foot house to make it more energy-efficient. We bought the property from Jennifer's parents, and it needed a lot of updating. Matt also constructed a chicken plucker and a scalding tub from a scavenged tub—the scalding tub is heated with a wood boiler (see bottom photo, above). All in all, we spent about \$850, whereas buying equivalent scalding and plucking equipment new would have cost about \$6,000. We're proud of our diesel-converted minivan, too. Matt and a friend transferred the diesel engine and manual transmission from our VW Jetta into our minivan so we now average about 37 mpg—nearly twice the van's prior gas mileage! Matt spent two weeks and only \$700 on additional parts for the conversion.

A couple of favorite smaller projects: We installed a heat exchanger on our woodstove to preheat water before it heads to the hot water heater, and Matt built an energy-free waterer for our



The Ebys raise cattle and other livestock, including poultry that they process using a self-built wood-heated scalding.

cattle that makes use of a tube that runs below the frost line to keep water from freezing.

Detail how you raise and sell your livestock.

We keep a small cow-calf herd of Highland cattle and raise Jersey steers—which we buy when they're a couple of days old—for meat. Our herd runs about 15- to 25-head depending on the time of year. We put three-quarters beef in our freezer for our own consumption annually. A couple of sheep "mow" our lawn each year, and we butcher one each fall.

We have about 175 to 250 laying hens for eggs to eat and to sell. We raise three batches of about 500 pastured broilers and several turkeys each year—most to sell, but some for our freezer.

Currently, we're able to market our products under a federal custom exemption for small farms that permits "freezer meat" sales. This ex-

emption allows us to butcher our own chickens and have our cows butchered locally, and to then sell the meat on-farm as long as the customers pre-order a live animal.

You have quite a lineup of luscious soaps, lotions and more. Which of those products do you sell?

We handcraft cold-process soap bars that contain only essential oils for scent; body butter, which works like lotion; and lip butter made from oils and local beeswax. We also make laundry powder and liquid laundry soap for sensitive skin (that costs only about 5 cents per load), and we mix up a dry shampoo with ingredients from the pantry plus bentonite clay.

We started selling soap when the friends and family we'd shared bars with asked where to buy more. The soap we sell is made with the same recipe and high-quality ingredients we use at home.

A Lovely, Debt-Free Ranch

Who: Tom and Ilene Preble.

Where: Peyton, Colo., since 1997.

What: Long View Ranch includes a hand-built, earth-bermed, mortgage-free home and outbuildings on 120 acres with chickens, gardens and pastures, all at 7,000 feet above sea level.

Homestead-based income: The Prebles sell eggs to friends, but instead of making much income, they embrace a simpler lifestyle—including forgoing TV and a landline phone, and limiting energy use to 200 kilowatt-hours per month on average—that allows them to live on less than \$20,000 annually.

Off-homestead employment: Tom and Ilene are both retired, but receive a pension from Tom's previous career as a senior field engineer.

How long have you been homesteading?

We've been homesteading for 27 years. We've lived in our self-built, 1,800-square-foot berm home for 18 years. Before that, we lived and saved in a 14-by-70-foot single-wide trailer for nine years. The trailer was on 5 acres, so we gardened and practiced the MOTHER EARTH NEWS lifestyle even then. For example, Ilene made "window quilts" to save energy in winter, and Tom safely installed a woodstove in the trailer.

What does being a modern homesteader mean to you?

It's a way of life. Being self-reliant and thrifty. Cultivating an independent, non-groupthink mindset and thinking way outside the box. Learning to slow down and appreciate what you've accomplished. For us, it's also enjoying a good cup of tea together on the deck of our ranch home, listening to the birds sing and the hens cackle on a Wednesday morning—and giving a high-five about our weekday freedom. Celebrating being snug and warm while nestled into the earth, heating only with wood, even when a blizzard rages outside. Being on the same page as one another.

Modern homesteaders reach out with their quiet, enduring examples. They take their positive outlooks and self esteem into the world, and they support others with their actions and attitudes.

When you *do* have to leave your dreamy homestead, what methods of transportation do you use?

For getting around the ranch to fix fencing and complete other chores, we have a solar-powered golf cart. We bought a used electric golf cart from Masek with six 6-volt batteries. Tom modified two Harbor Freight solar kits to charge the batteries. The whole setup cost about \$1,000. For most of the year, we run errands in our 2011 electric Nissan Leaf, which we bought used. When we drive to a nearby city, we charge the car at high-speed charging



The Prebles' hand-built bermed home overlooks their ranch, which includes pastures of grazing cattle and a newly built gazebo with a long view.



stations. At home, we charge the Leaf on a 240-volt welder outlet.

How do you save energy?

Our passive solar, earth-sheltered house is super-insulated, and we heat with less than a cord of wood a year. It has no north windows; you can walk onto the roof from the north. Our appliances are EnergyStar, and we've switched to spiral and LED lighting, blanketed our water heater, put up insulated window shades, and installed a root cellar in the garage.

In our house, we "run the system." On winter days, the low sun floods our home with free light and heat. We drop our insulated blinds at sundown to retain that solar gain. In summer, we open up the windows at night, and we close them upon arising to keep our home comfortable throughout even the hottest stretches.

Describe any building projects.

We built our home and eight outbuildings, including barns, chicken coops and a writing studio. Tom worked every day for two years building the house right after he retired. Ilene kept the home fires burning and homeschooled our children. Building our house cost about \$50,000 total. After we moved into our home, we built the barns and studio. We had more time, so we were able to gather inexpensive used and odd materials for our building projects. The studio cost about \$5,000 to build, and the barns ran \$1 to \$1.50 per square foot because Tom built with used metal sheeting, discounted trusses and scrounged lumber. Tom also planted two pine trees a hammock's-width apart many years ago. Now we share the big net hammock on summer evenings. 🌲

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STAY COOL NATURALLY

These adjustments will help you ditch your
AC addiction, even in scorching summer weather.

By Stan Cox

Fifty years ago, about nine out of 10 U.S. residents spent summertime in homes without air conditioning. Suggest turning off the AC in summer these days, however, and you'll frequently encounter wide-eyed disbelief. Our society has come to regard refrigerant-based air conditioning as an indispensable technology, and has forgotten about plenty of other cheaper, simpler ways to beat the heat.

Come Out of the Cold

The central problem with our dependence on air conditioning is its voracious energy appetite. At current usage rates, air conditioning U.S. homes, businesses,

schools and vehicles releases fossil carbon and fluorocarbon refrigerants that have a total annual global-warming impact equivalent to a half-billion tons of carbon dioxide. Eliminating these emissions from air conditioning would benefit the atmosphere as much as shutting down 140 typical coal-fired power plants would.

Air conditioning also eats a sizable chunk of our budgets. In the United States, I estimate that our collective annual electric bill for cooling our homes is about \$30 billion. The yearly cost per household ranges from about \$200 in the Northeast to more than \$450 in the sweltering South.

So, how do we wean ourselves off of this energy-intensive habit? The range of available strategies for summer comfort

depends on where you live: in the North or South, on a forested hillside or in an urban heat island, in an apartment or a house. But whatever your situation, you can find ways to stay comfortable without air conditioning—starting by adjusting your internal dial.

Your Inner Thermostat

Fifteen years ago, thermal comfort researchers Richard de Dear and Gail Brager—citing research that had examined thousands of human subjects in studies from around the world—pioneered the “adaptive model of comfort.” This principle shows that our bodies’ preferred indoor temperature isn’t fixed. Rather, our tolerance for hot air shifts depending on the temperatures we’ve recently experienced. Superfluous reliance on air conditioning thus hampers our ability to acclimate to higher temperatures. The more you expose yourself to higher temperatures, the more you’ll feel comfortable without switching on the AC.

In hot weather, we need help shedding the heat our bodies generate. Air conditioning does that, but only a small portion of the energy it consumes helps cool your body. A lot more of its energy goes into chilling concrete, brick, wood, metal and empty space. Many of the following alternative cooling practices are aimed more specifically at cooling *people*.

Tap Into Water’s Refreshing Effects

Water will cool you off even faster than air. Direct contact with cold water not only provides instant relief through evaporative cooling, but also has lingering effects that can help get you through the last couple of hours before sunset.



Cook outdoors to keep from heating up your home, and eat in the cool evening breeze.

Wear a dampened kerchief around your neck. Take cold showers and drink plenty of water. If your garden needs a drink, set the sprinkler to overshoot a little and send the kids (or yourself) out to cool off.

Mechanical evaporative coolers—units that transfer heat from air to water to create a cool breeze—are highly effective in regions with hot, dry summers. (Learn about a new kind of “swamp cooler” at <http://goo.gl/kpdyfy>.) You can also achieve this type of cooling via lower-tech methods, such as hanging a wet sheet over an open window or door to catch the breeze coming through, or situating a fan to blow air across salted ice or frozen water bottles.

Home Cool Home

A warm home with plenty of airflow from fans and open windows can be more pleasant than one that's sealed up and air-conditioned. During the hottest stretch of the day, wear light clothing, keep your south and west windows closed and shaded, and turn on ceiling fans. After sunset, open windows all around your home. Use fans to flush warm air out and pull cooler nighttime air in. An attic fan or whole-house fan running at night is most effective, but you can also help cool a room by installing box fans in two separate windows, with one fan pulling air in and one pushing it out. Hot air that rises to the top of the house can exit via attic vents, which don't require electricity to function.

A screen door will increase airflow from outside, and on a balmy afternoon or evening, a screened-in porch (or the shade of a tree, if mosquitoes aren't bad) can still be quite comfortable, especially if there's a breeze or you have a fan going. If you have a basement, take advantage of its free geothermal-cooled environment.

Vegetation has a cooling effect, as well. If possible, plant deciduous trees on the south and west sides of your house to block sunlight in summer and let it through in winter. If your trees aren't yet big enough to cast much shade, put other types of



Screened porches offer relief from hot, stuffy air while keeping bugs at bay.

tall plants, such as giant reeds or sunflowers, along the sunbaked sides of the house. Climbing plants, such as grapevines, can also provide a cool green screen over windows in summer but allow sunlight and heat through in winter. A “green roof,” one covered in grass or other vegetation, cools effectively but can be costly. In a warm climate, white roofs can help cool by deflecting sunlight.

The less heat you generate inside your home, the easier it will be to cool off. All energy-consuming appliances and devices produce heat, so don't run anything that's unnecessary. Switch to CFLs or LEDs instead of using incandescent light bulbs, which actually expend 90 percent of their energy on producing heat. Keep your oven off and avoid boiling anything on your stovetop, which releases humidity in addition to heat. Eat less hot, heavy food, which warms you up internally.



Sprinting through a sprinkler set up near your garden is one of the easiest ways to stymie sweat.

Hang wet laundry on a clothesline rather than turning on your dryer.

By making some of these changes in your home and routine, while throwing in a few ideas of your own, you can let the fresh air in and still be comfortable all summer long. 🌳

Stan Cox is the research coordinator at The Land Institute in Salina, Kan. His book *Losing Our Cool: Uncomfortable Truths About Our Air-Conditioned World* is available on Page 72.

Readers' Tips on Keeping Cool Through Sultry Summers

We turned to our Facebook community for recommendations on handling summer heat sans AC. Here are some of their coolest tips. —MOTHER

Drink lots of water. One summer, my family made an effort to properly hydrate for a week, and it took much more heat and humidity to bother us. —Shawn McPheron

I bought a cheap plastic dish tub that I use to soak my feet in cold water from our well. Amazingly, a good foot soak can cool

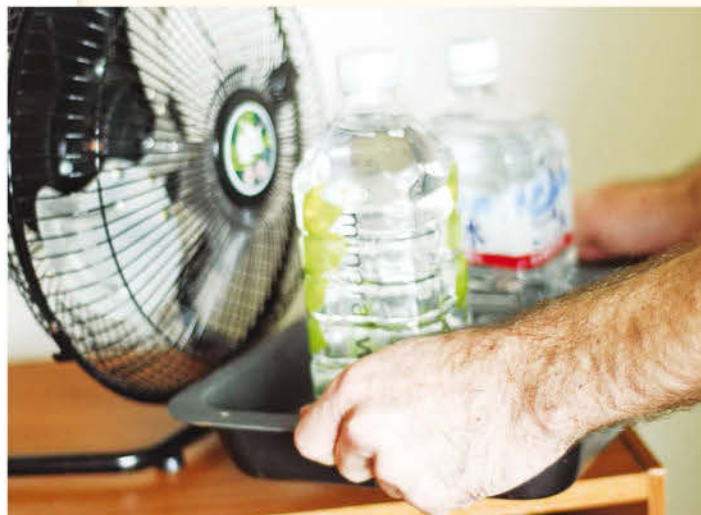
you off for hours! I also plan my meals ahead of time and cook just one day per week. If you do this, plan to just quickly reheat the meals, or eat cold meals with more fruits and vegetables so your kitchen stays cooler. Think pasta salads, fruits, hummus—even granola and yogurt are great! Most of us don't want big, heavy meals on hot days anyway. —Rebecca Lewis Bell

Freeze salt water in a plastic bottle overnight, and then place the bottle in front of a fan. The salt water will take longer to melt than water without salt. —Robert Hocker

I covered my window with a plastic roofing panel that I cut to fit tightly in the window's wooden frame. This was a cheap fix and the most effective method I've found to block both heat and cold while still allowing full sun into the room. Plus, I don't have to wash heavy curtains! I have now covered six large windows and the results are measurable. —VJ Walker

This project will take a bit of MacGyvering, but, if you're so inclined, it's not hard to build and will work wonders on hot days. I got a large plastic tote box and cut a few big holes into the lid. I filled the tote with ice and put a battery-powered fan above one of the holes, facing inward. The cold air vents out of the other holes to cool the room. —Putsch Lou

Each summer, I cover all the west windows in my home with car shades, which are typically used for windshields. You can find them at dollar stores. I cut my power bill in summer by 40 percent the first year I did this, and ran my AC almost 50 percent less. It was *hot* in my home before this fix, and now it's so wonderfully comfortable—and I live in the Deep South! —Susan Dyer



Low-tech, DIY “air conditioners” are simple to set up—as easy as setting frozen water bottles in front of a fan.

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Circle #9; see card pg 81



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BEST CIDER APPLES

Plus a DIY Press!

To craft batches of cider to sigh for, prune your planting list to these six expert picks.

By Tom Burford

In a well-crafted, truly flavorful cider, the pressed apples must contain a balance of sugar, acid, tannin and aroma. Few varieties cover all the bases, but a blend of apples will balance out any individual weak-

nesses. The following are six of my favorites from the hundreds of apples I've encountered in my decades as an orchardist. Each variety has merits proven ideal for making cider, and will also be delightful for fresh eating. You can grow these cider apple varieties in a sunny spot on your property or seek

them out at local markets and pick-your-own orchards.

① 'Arkansas Black' is suited to fresh eating, cooking and cider-making. This 19th century variety produces fruit that's as hard as a rock—an excellent storage quality in an apple. The yellow flesh is firm and crisp with a distinctive flavor that's enhanced after a few months in storage. 'Arkansas Black' is resistant to most major diseases, but it's vulnerable to apple scab and fire blight.





'Arkansas Black'



'Goldrush'



'Grimes Golden'

2 **'Goldrush'**, the most modern variety in my top six, is a dessert apple that has become the darling of professional cider-makers. Developed in 1972 at Purdue University, 'Goldrush' exhibits a sweet-tart flavor and is a long keeper. The flesh is high in acid and sugar, with a rich, spicy flavor that improves in storage. 'Goldrush' trees are prone to cedar apple rust, but they're highly resistant to powdery mildew and apple scab disease.

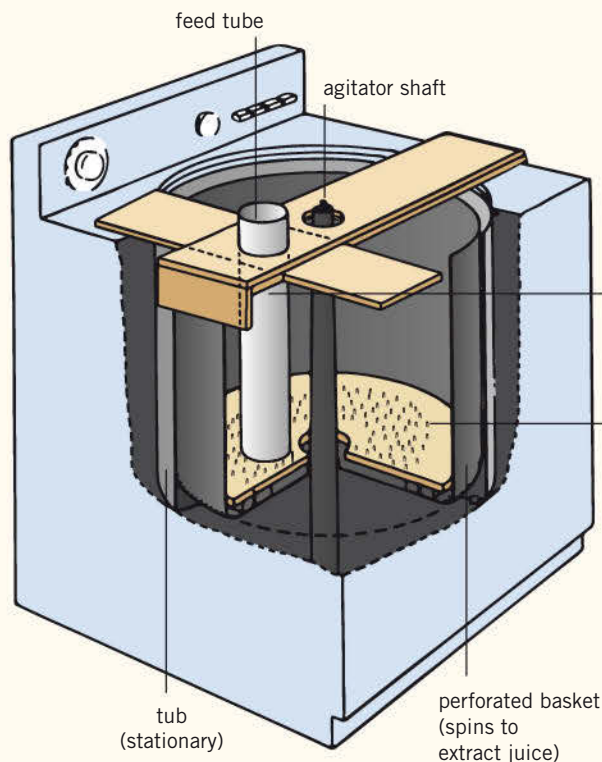
3 **'Grimes Golden'** is believed to be a parent of 'Golden Delicious.' Popular for making brandy and cider because of its high sugar content of 18.8 percent, 'Grimes Golden' juice will ferment to 9 percent alcohol in hard cider. The ap-

ple's crisp flesh has a spicy, sweet flavor. 'Grimes Golden' is tasty when sliced and fried or when made into apple butter. Only an average keeper, this cider apple variety is moderately susceptible to common apple diseases—especially collar rot—but somewhat resistant to fire blight and cedar apple rust.

4 **'Harrison'** makes a dark drink that leaves a memorable sensation in the mouth. This variety's rich juice will produce the quintessential North American cider on its own or when combined with the juice of another cider apple. The dense, yellow flesh yields a high volume of juice when pressed. I've measured the volume produced by 'Harrison' at 18 percent higher than that yielded by an

equal amount of 'Winesap' fruit. This apple stores well and is appropriate for desserts and culinary uses. 'Harrison' trees are vigorous, heavy bearers and are resistant to apple scab.

5 **'Roxbury Russet'** is likely the oldest named North American apple variety, dating back to the mid-1600s. These trees bear an all-purpose fruit suited to cider-making, with coarse flesh that's more sweet than tart when fully ripe. The juice contains nearly 13 percent sugar, which will ferment to 6 percent alcohol in hard cider. This fruit is fine in desserts, and retains its flavor when dried. 'Roxbury Russet' offers good resistance to apple scab and powdery mildew, and it's moderately



How to Convert a Washing Machine to Make Cider

Consider converting an old washing machine into an extra-large juicer using these updated instructions from our Archive (September/October 1982). See readers' adaptations of these plans—and watch washing machine juicers in operation—at <http://goo.gl/fm3wpY> and <http://goo.gl/q2mTQt>. —MOTHER

I've long marveled at the workings of centrifugal-force countertop juicers. Because I have access to large quantities of free apples, I decided to incorporate the same principles into a much larger juice extractor: the family washing machine.

First, I opened the top of the metal cabinet and removed all the unneeded hardware, gaining access to the tub, and removed the agitator from its shaft. Then, I built a shredder by using a jigsaw to cut a doughnut-shaped piece of 3/4-inch exterior-grade plywood to fit the bottom of the washing machine's perforated basket. (To

build a shredder that's easier to install inside the tub, you could make it collapsible by cutting the disk into two pieces along the circle's diameter and then hinging those pieces together.) I drove several hundred 1-inch panel nails through the plywood so their protruding points would serve as the apple-shredder's "teeth."

To make juice, line the tub with netting to contain the pulp, install the shredder and bridge assembly, and set the machine to spin. The shredder's nails will mince apples dropped down the feed tube, and juice will pour out of the washer's drain hose.



'Harrison'



'Roxbury Russet'



'Winesap'

susceptible to fire blight and cedar apple rust.

6 **'Winesap'** was first described as one of the best apples for cider in 1804, and now dozens of strains exist. This long-keeping apple is sweet, crisp and aromatic. The versatile fruit is also a fine dessert apple and is delicious in brandy, applesauce and apple butter. Standard rootstock trees will grow vigorously, reaching as high as 30 feet tall and producing heavy crops—as many as 100 bushels in a single season. **'Winesap'** trees are geographically adaptable, moderately resistant to all the major apple diseases, and escape late frosts because they bloom a few days later than mainstream varieties.

Bonus: Other worthy and historically proven cider apple varieties are **'Baldwin,'** **'Ben Davis,'** **'Black Twig,'** **'Empire,'** **'Honeycrisp,'** **'Jonathan,'** **'Newtown Pippin'** (aka **'Albemarle'**), **'Northern Spy,'** **'Razor Russet,'** **'Smokehouse,'** **'Stayman,'** **'Virginia Crab'** (aka **'Hewes Crab'**), **'Wickson Crab'** and **'Yates.'** 🌳

Known as "Professor Apple," Tom Burford is dedicated to planting seeds of knowledge about heirloom apples. His award-winning book, *Apples of North America*, is available on Page 72 at a 25 percent discount until Sept. 30, 2015.

RESOURCES

MAIL-ORDER APPLE TREES

www.FedcoSeeds.com

www.GreenmantleNursery.com

www.TreesOfAntiquity.com

www.VintageVirginiaApples.com

CIDER PRESSES

www.HappyValleyRanch.com

www.MeadowCreature.com/Avalon

www.WhizbangCider.com

www.Lehmans.com

www.PleasantHillGrain.com

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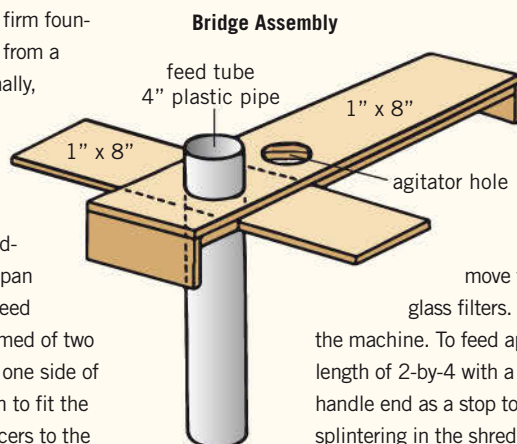
cider resources on our website:

<http://goo.gl/yKbyQ8>

To give the newly fashioned shredder a firm foundation, I placed it on three feet, each cut from a 2-by-4 and glued and nailed in place. Finally, I fastened the assembly to the basket with three screws, one in each foot, through perforations in the bottom of the machine's tub.

To hold the apples while the nails shredded them, I made a bridge assembly to span the top of the machine and support the feed tube (pictured at right). The bridge is formed of two 1-by-8 boards, which cross off-center on one side of the agitator shaft (adjust the board length to fit the surface of your machine). Add board spacers to the underside of the top crosspiece so the bridge will sit level on the top of your machine. You should also add vertical boards at the ends to hold the bridge snugly in place. At the point on the bridge where the two boards cross, I cut a hole just large enough to force in a piece of new 4-inch plastic pipe. I pushed the lower end of the pipe down to within 1/4-inch of the shredder's nail points and sealed it to the bridge with a liberal amount of epoxy. To stabilize the feed tube, you may need to add additional wooden blocks to the bottom of the crosspiece.

At this point, if you dropped an apple down the fruit chute with the basket spinning, the nails would chew it to bits and the washer's



centrifugal force would throw those pieces through the holes in the basket and into the pump. To prevent this from happening, I lined my tub with a filter made of several yards of sheer nylon mesh, plus another layer of fiberglass screening.

The machine can swallow about 2 bushels of fruit before it must spin-dry so you can remove the accumulated pulp from the nylon and fiberglass filters. Be sure to wear eye protection when operating the machine. To feed apples down the tube to the shredder, use a short length of 2-by-4 with a shorter piece of 1-by-2 nailed crosswise to its handle end as a stop to keep the "pusher" from going down too far and splintering in the shredder.

After collecting a hefty batch of apples for the trial run, I turned the washer selector to "spin/normal" and pulled the knob. The juicer worked perfectly, making 60 gallons of fresh cider in four hours. Two weeks later—with more containers, apples and helpers—the machine made 120 gallons of squeezings in just six hours. I found that a bushel of **'McIntosh'** apples can yield up to 3½ gallons of cider. A blend of several different apple varieties makes an even better thirst quencher.

My moonlighting Maytag juice extractor took about 16 hours and \$20 worth of materials to make, but who can put a price on a frosted mug of tart, homemade apple cider on an autumn night?

—Dean Bull



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Circle #14; see card pg 81



EVERYDAY SOLAR COOKING

If you can't stand the heat, get out of the kitchen and cook with free power from the sun.

By Joel Dufour

Summer's arrived and the heat is inescapable. You don't want to turn on the stove to make dinner, which will heat up the house even more. If you're like me and don't have air conditioning—or if you're energy conscious and keep the AC low—cooking indoors can be unbearable. Instead, why not use the source of all this heat to your advantage?

Solar radiation is the most prolific source of energy on our planet. About 84 billion kilowatt-hours of light reach Earth every day—more than four times our global energy consumption. The challenge is to efficiently harness this energy. Most people settle for gathering solar energy by eating vegetables from their gardens or catching its reflection with their cameras. Trap that energy in an insulated box with some food—then you'll really be cookin'!

The functioning principles of a solar oven are simple: concentrate, convert, contain. Sunlight—or visible light—is concentrated by several reflective surfaces to pass through a glass lid into an insulated box. A pot of food you put inside the box will absorb the light and convert it into longer-wavelength infrared energy, or heat. The insulation will inhibit the heat from escaping, and the wavelengths will be too long to pass back through the glass lid. So, they'll bounce around and heat up your food. Ever leave your car windows closed on a bright, warm day? Then you'll recognize the basic principles of solar cooking.



The author and his daughter Sophie are shown with their solar oven. This model includes a rear door for swift food removal and wheels for mobility.

Building the Solar Oven

Nearly 20 years ago, as I was helping a friend build his straw bale house (at which point he figured out I was into “weird stuff”), he mentioned that some people he knew were teaching a solar-oven-building workshop. I was intrigued, so I sent in my 50 bucks to attend. Three weeks later, I found myself on a homestead out in the Kentucky woods, looking at the piles of plywood, cardboard, tinfoil and glass that were to become solar ovens. The instructors, Mark and Andy, had just returned from a nonprofit-sponsored trip to Peru, where they taught people how to build and use solar cookers. Many of Peru’s

mountain villages suffer from deforestation, so solar cooking offers a good alternative to cooking with wood.

That day, using only hand tools, I built my own “yard appliance.” This solar cooker requires only cheap materials and the design is so simple: square, with an inner box and an outer box separated by 1 or 2 inches of insulation, and a glass cover on the inner box to let in sunlight. Additionally, four reflectors are arrayed at obtuse angles to the glass to focus more light into the box and raise its internal temperature enough to make cooking possible. We used plywood for the outer box for rigidity and durability, and crumpled

newspapers for insulation. A variety of materials can serve as insulation, including sawdust, chicken feathers or fiberglass batting. Insulation is key, because you want to trap heat in the box as effectively as possible to offset shading by clouds that will invariably show up to block the sun. In optimal conditions, the cookers we built can heat to 400 degrees Fahrenheit in about an hour, which is hot enough to cook anything from a casserole to biscuits. That’s a pretty good appliance for only a \$50 investment. For me, the deal was even sweeter—I married Mark’s sister a few years later, and we’ve been solar cooking together ever since.

BOTTOM LEFT: RUSTY BUGGY ENTERPRISES; BOTTOM RIGHT: LEON WERDINGER



Whether you build a solar oven or buy one, such as the Sun Oven (left) or Solavore Sport (top right), baking and roasting will be on the menu.

Operation Basics

You can easily manage a solar cooker by keeping these elements in mind:

Sun. Don't put the oven where a shadow will fall across it. If you use recycled glass for the top, make sure it hasn't been treated with UV-resistant coating.

Time. Cooking times are longer than in a conventional oven because average temperatures fluctuate during the day. As long as the oven temperature remains above 200 degrees, your food will still cook.

A sense of adventure. You never really know what the weather will do.

For best results, preheat the oven for at least 30 minutes—allow it to heat while empty or with an empty pot inside. Also, someone should be around to adjust the cooker now and then. The reflectors will angle sunlight into the box for about two hours of the sun's path across the sky, after which you should rotate the cooker to follow the sun. With this method, solar cooking will take about twice as long as cooking with electricity or gas, but cooking time will decrease dramatically if you rotate the oven every 30 minutes.

Cover reflectors with basic aluminum foil, Mylar tape, acrylic mirror or other highly reflective products. The top of your solar cooker should be inclined, either by design or by tilting the box on blocks. The best angle is based on your latitude and the declination of the sun, but in the Northern Hemisphere it should be about 30 degrees during summer and 60 degrees during winter. To increase your solar oven's ability to convert light to heat, paint the bottom of its interior with black, high-heat paint. To improve heat-holding ability, add some thermal mass, such as a large



Delicias del Sol Villaseca, a restaurant north of Santiago, Chile, turned to solar energy when deforestation depleted its fuel source. Its fleet of solar ovens can feed up to 120 daily.

rock or brick. On days with strong sun and no cloud cover, two to three hours is enough to cook almost anything, from a pot of rice to a loaf of bread, without adjusting the cooker.

Success with the Sun

I put my oven to use right away and had fun figuring out what worked. When cooking grains or beans, you only need a little more than half as much water as on a stovetop. Cooking veggies in the slow, even heat results in incredibly savory dishes. Food rarely burns, and only ever on top, so nothing ever sticks to the bottom of the pot. Even bread, pastries and meat will do well, although you'll need to maintain a high average temperature, so plan in advance, and cook on days forecasted to be completely clear and sunny. Frying is difficult as the temperature typically isn't high enough and you'll lose heat every time you open the cooker to stir the pan—but you could experiment with quick-cooking foods, such as eggs.

Dark-colored cookware works best—dark objects convert sunlight into heat energy more easily than light-colored or reflective objects. Cast iron, black enamel and dark ceramic are good options, and lids help hold in heat. But, when cooking colorful veggies, don't use a clear lid. The concentrated sunlight will bleach the vegetables' color.

I painted the outside of a couple of wide-mouth, quart-sized Mason jars flat black with high-heat paint (including the

outsides of the lids), and these became my rice- and bean-cooking jars. They heat up quickly, are space-efficient, and double as storage jars for leftovers. Never fill the jar more than half-full, including water. A cup of brown rice needs 1½ cups of water and is usually done after 70 minutes. Don't tighten the lid all the way when cooking in a jar or you'll risk an explosion.

I used that first oven for five years before my wife and I replaced it with a much larger unit. We mounted the new oven on the roof of our earth-bermed house. We live in the woods, and our roof is the only place with reliable sun—but the cooker is easy to access because we can walk right onto its surface from the rear of the house. We use the solar cooker for the majority of our hot meals from April through October. The sun is too weak, spotty and low in the sky in our area to rely on for solar cooking during winter. And by then, we're using our woodstove for heat, so we often cook on that. We tarp the solar cooker during winter to prolong its life span. For a small investment and a little know-how, you, too, can get cookin'! 🌞

Joel Dufour lives in an electricity-free home he built with his wife, Chris, in the woods near Frankfort, Ky. He's been solar cooking since 1994. He owns and operates Earth Tools, a gardening-equipment supply company (www.EarthTools.com).

RESOURCES

BUILD A SOLAR COOKER

Solar Cookers International:

www.SolarCookers.org/Involved/Basics

Solar Cooker at CantinaWest:

www.SolarCooker-at-CantinaWest.com


BUY A SOLAR COOKER

GoSun: www.GoSunStove.com

Solavore Sport: www.Solavore.com

SolSource: www.OneEarthDesigns.com

Sun Oven: www.SunOven.com



TOP WAYS TO GET RID OF TICKS

Free-range poultry scavenge in fallen leaves and tall grass for their meals, and ticks are often on the menu.

Nix ticks from your yard, home and body to prevent Lyme and other diseases.

By Barbara Pleasant

About 300,000 people are diagnosed with Lyme disease every year, according to new estimates from the Centers for Disease Control and Prevention (CDC). Lyme disease is caused by bacteria that multiply in the bodies of ticks, people and animals, including mice, deer and dogs. A whopping 95 percent of human Lyme disease cases are concentrated in only 14 states situated throughout the Northeast, Mid-Atlantic and Upper Midwest (see map, Page 48), but infections have been reported across the country and into Canada. Scientists predict that Lyme disease will continue to spread as climate

change causes an increase in the humid summer conditions and mild fall weather favored by the tiny blacklegged deer tick, which is the most common transmitter of Lyme disease.

These deer ticks pick up Lyme bacteria (*Borrelia burgdorferi*) when they feed on the blood of infected mice, chipmunks and other hosts. Infected ticks in both the nymphal and adult life stages can then transfer the Lyme bacteria to humans if they latch on for a meal and feed for approximately 36 hours or more. Lyme disease is highly treatable when it's detected early, but devastating when the infection goes unnoticed for more than a few months. An early-generation Lyme

disease vaccine is available for dogs, but people must rely on other defensive measures to avoid ticks and the diseases they often carry. If you're interested in getting a Lyme disease vaccine for your dog, discuss options with your veterinarian and read up on it at <http://goo.gl/WQwYpT>.

Kill Ticks with Chicks

Leafy wooded areas and grassy meadows are the preferred habitats for blacklegged deer ticks and American dog ticks, which both spend their larval stage in leaf litter, their nymphal stage on small animals, and their adult stage in tall grass or other shrubby vegetation. People who keep free-range poultry have long reported that foraging chickens and guinea fowl will help rid a property of ticks. In April 2015, we launched the MOTHER EARTH NEWS Chickens and Ticks Survey, and responses revealed that:

- 71 percent had an existing tick problem before they got poultry.
- 78 percent kept poultry that helped control or eliminate ticks within the birds' feeding range.
- 46 percent experienced a drop in tick populations within a month after getting poultry; 45 percent saw good control after several months to a year.

Many respondents noted that small bantam chickens and game hens can get into tight spots where larger birds can't fit, resulting in better tick control.

For maximum effectiveness, poultry should be allowed to feed in leaf litter starting in early spring, because that's where ticks and their eggs hide out during winter. Poultry will eagerly work their way through leaf piles and ground debris when given the opportunity. Poultry also help control other pests, including mosquitoes, grasshoppers and even snakes; see "Poultry Pest Patrol" at <http://goo.gl/D44rRJ> for more on these winged pest warriors.

Permethrin-Treated Clothes and 'Tick Tubes'

If you live in one of the 14 states where Lyme disease risk is highest—and you spend a lot of time outdoors in tick habitat—you might want to consider using permethrin, a non-organic pesticide that repels and kills ticks. Permethrin is more potent and persistent than the organic materials we usually recommend. We suggest using a formula designed to be applied to clothing rather than misters, sprayers, foggers or other permethrin products. Clothing products that are pre-treated with permethrin are available, or you can buy permethrin with instructions for how to use it to treat your clothes. Take care to not expose kids to this pesticide, as studies have linked permethrin exposure to autism in children. The EPA also classified permethrin as "likely to be carcinogenic to humans," so weigh the risk of infrequent exposure to the risk of Lyme disease in your area.

You might also consider permethrin-infused "tick tubes," which are designed to kill ticks on white-footed mice as well as chipmunks and rats, the main animals

10 Options for Tick Control

- 1 Raise free-range poultry.
- 2 Maintain wide, mowed walking paths.
- 3 Use herbal insect repellents.
- 4 Install deer fencing around your property.
- 5 Place "tick tubes" strategically.
- 6 Rake up and compost leaf litter in fall.
- 7 Wear protective, light-colored clothing.
- 8 Check your body for ticks after being outside.
- 9 After time outdoors, put clothes in a hot dryer for 15 minutes before washing.
- 10 Wear permethrin-treated clothing.

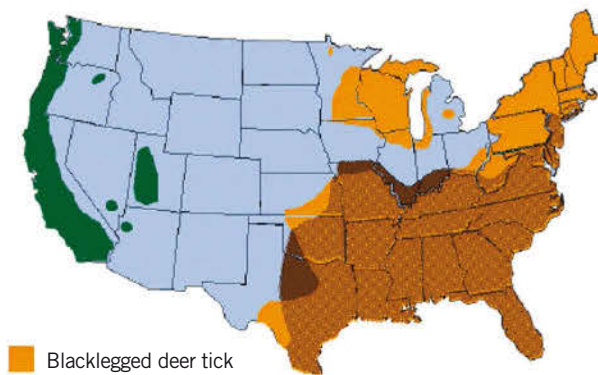
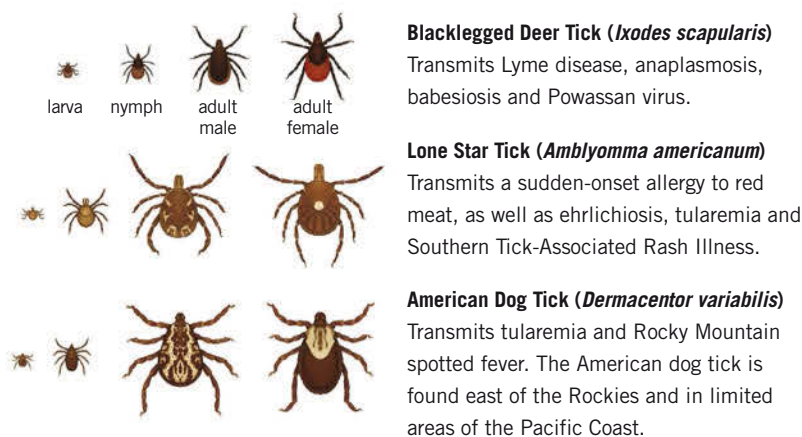
from which ticks become infected with Lyme. The tick tubes offer nesting materials impregnated with the pesticide to such critters. The animals then take the material back to their nests, where it kills any ticks that may have latched on to the adults and their young. The small amount of per-

methrin used in tick tubes is not water-soluble, so it's not likely to end up anywhere but in a nest.

Sold commercially as Damminix Tick Tubes (www.TickTubes.com), these devices are easy to make yourself. Wear rubber gloves and saturate cotton balls, strips of cloth, dryer lint or other rodent nesting materials with a permethrin product made to go on clothing and tents. Then, loosely pack the treated material into pieces of plastic pipe that are about the size of a toilet paper roll, and place them behind logs, in brush piles, or in other locations rodents often visit. In suburban and urban landscapes, dense ground cover has been found to attract mice, so it's a good place to put tick tubes. After mice and other rodents empty the tubes, replace or reload the pipes. This is

Tick Identification Guide

Tick species found nationwide can carry a variety of harmful diseases.



- Blacklegged deer tick
- Western blacklegged tick (also carries Lyme disease)
- Lone Star tick
- Lone Star tick and blacklegged deer tick overlap

Where They're Located

Ticks are found in every state, though species and population numbers vary with climate.



Maintain well-mowed areas and wide paths to prevent bites from questing ticks.

best done twice a year—once in spring and again in fall.

Herbal Tick Repellents

Many of our survey respondents reported that they apply veterinary-prescribed tick preventatives on their dogs and cats, but would prefer more organic repellents. Two plant-based aromatics—sweet-scented “rose” geranium (*Pelargonium graveolens*) essential oil and eastern red cedar (*Juniperus virginiana*; also known as “red cedarwood”) essential oil—were repeatedly recommended by readers who use them as spray-on repellents for pets and family members alike. Respondents theorized that these two plant aromatics mask your natural odors, which makes it harder for questing ticks to find you. Both geranium essential oil and

eastern red cedar essential oil have proven to be successful repellents against ticks in various life stages, according to the *Journal of Agricultural and Food Chemistry* and the *Journal of Medical Entomology*, respectively.

Using full-strength essential oil can injure human skin and overwhelm pets’ sensitive noses, so follow this simple recipe when making a liquid anti-tick spray: In an 8-ounce spray bottle, combine 10 to 20 drops of rose geranium or eastern red cedar essential oil with 1 teaspoon of vodka or rubbing alcohol. Fill the rest of the bottle with water and shake to combine. The spray can be applied to your skin or clothing. You can spray your dogs’ collars, or spritz the same spots where you would apply other tick preventatives—between the animal’s shoulder blades and at the base of the tail. Before taking your dogs

into woods, where they’re likely to pick up ticks, you can lightly spray their legs, too.

You can also add dry herbs to your tick-fighting arsenal for pets. Strew dried and pulverized wormwood (*Artemisia absinthium*) or pennyroyal (*Mentha pulegium*) leaves on pet beds and outdoor sleeping spots to repel mites and ticks. If you have beautyberry bushes (*Callicarpa americana*), you can use the leaves (or a strong tea made from them) to repel ticks, fleas and mosquitoes. USDA scientists in Maryland have validated this historic use of beautyberry, according to findings published in *Experimental and Applied Acarology*. Two beautyberry compounds, callicarpenal and intermedeol, have even been found to repel fire ants. Research continues into beautyberry’s safety and best uses, so for now we suggest the pillow-case approach—add dried leaves to a cloth pouch placed in your pets’ beds, or lightly spray your pets’ beds with beautyberry tea.

More Anti-Tick Tricks

Fencing out deer, the primary host of adult Lyme-infected ticks, can help prevent ticks from reaching your land. Low-cost, plastic-mesh deer fencing is available online and at farm stores.

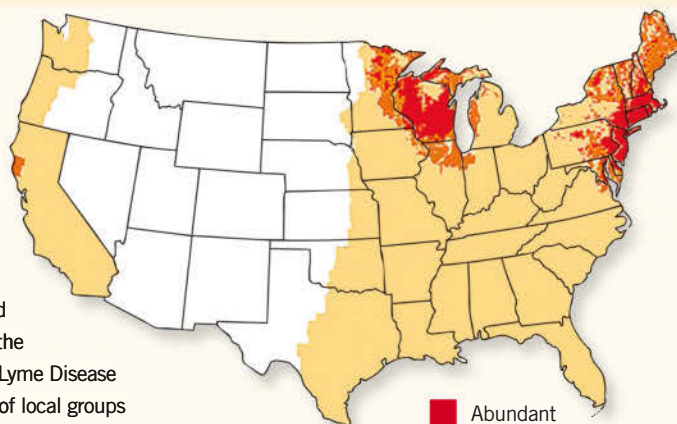
Ticks rarely inhabit lawns that are mowed regularly. Raking up leaves and composting them deprives overwintering ticks of shelter.

When hiking where tick populations are high, stay on the trails and dress

Lyme Disease Update

A circular bull’s-eye rash around a tick bite is a common indication associated with Lyme disease, but any tick bite that stays red and inflamed should be seen by a doctor who is familiar with Lyme disease. A course of appropriate antibiotics taken within three weeks of infection usually cures it.

When untreated, Lyme disease can become chronic Lyme disease, which causes headaches, body pain, lethargy and other complications. Some patients with chronic Lyme disease respond to antibiotics, while others adapt as well as they can, often with the help of a Lyme-Literate Doctor (LLMD) and support groups. The Lyme Disease Network (www.LymeNet.org) hosts a support forum and a listing of local groups by state, and the American Lyme Disease Foundation (www.ALDF.com) has a number of helpful online resources. Some online support groups follow the protocols outlined by Richard Horowitz, M.D., in his book *Why Can’t I Get Better? Solving the Mystery of Lyme and Chronic Disease*, available on Page 72.



The highest risk areas for Lyme disease are in red and dark-orange.

- Abundant
- Common
- Rare
- None reported

SOURCE: THE AMERICAN LYME DISEASE FOUNDATION/MATTHEW T. STALLBAUMER

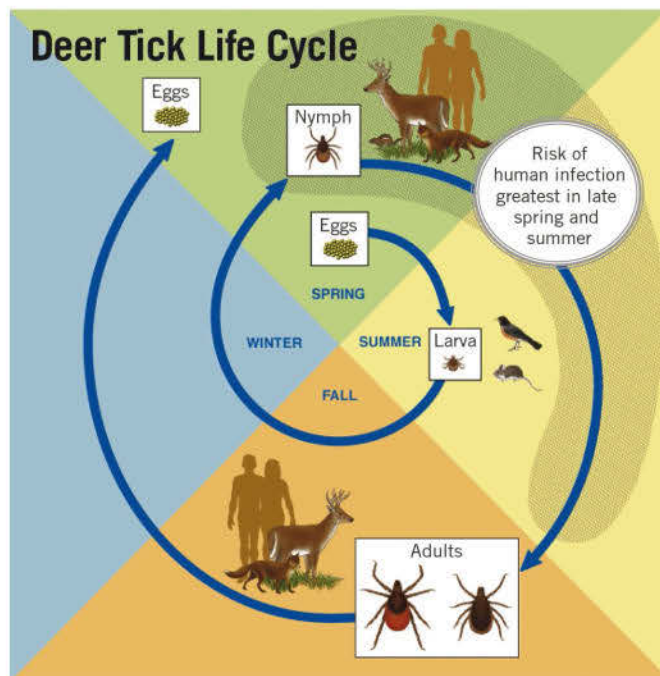
defensively — pull your socks up over your pants. When only shorts will do, some people cut off the ankle sections of old socks, spray them with a repellent, and wear the tubes around their calves like tick-detering leg warmers.

A study published in *Experimental and Applied Acarology* found that spraying outdoor areas with Safer-brand organic insecticidal soap in spring, when blacklegged deer tick nymphs are active, can provide treatment that is equally as effective as spraying with the insecticide chlorpyrifos.

After you've been outdoors, check your dogs for any ticks that may have latched on, and then make your way to a hot, soapy shower followed by a careful body check. You can kill any ticks that have attached to your clothing by immediately

putting your clothes into the dryer for 15 minutes on the hottest setting, and *then* washing them. Most ticks are sensitive to dry heat, but may survive even the hottest wash.

Studies have shown that it usually takes an infected tick about 36 to 48 hours after



Blacklegged deer ticks, a common carrier of Lyme disease, have two-year life cycles. Hard-to-find nymphs pose the largest threat during spring and summer.

biting its host to begin transmitting Lyme disease, which is why spotting and removing ticks as soon as possible is important. Ticks in the nymph stage—when they are about the size of poppy seeds—are active in late spring and early summer, and are the hardest to find on your body. These ticks pose the largest Lyme threat to humans and pets (see illustration, left).

We thank Dr. Keith Clay, tick expert and distinguished professor of biology at Indiana University, for his review of this article.

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The Tips You Need to GROW GREAT GARLIC

Use this season-by-season guide to cultivate a treasure trove of fat, flavor-packed cloves.

By Roberta Bailey

If I could grow only one crop, it would be garlic: pungent, mouthwatering, plump-cloved, health-promoting garlic. Over the years, I've learned some tricks for growing an exceptional, flavor-packed crop. Before you dig in, you need to know the basic types to choose from. Garlic (*Allium sativum*) is divided into two subspecies: var. *ophioscorodon* and var. *sativum*.

Most often planted in climates with cold winters, *ophioscorodon* garlic is called "top-setting," "ophio" or "hardneck" garlic; the family includes Rocambole, Continental and Asiatic types. Leaves grow from a hard, central stalk, and then an edible scape (flower head) forms, with tiny buds called "bulbils." Most hardneck varieties form four to eight cloves around the central stalk's base. Their flavor tends to be pungent, but often has subtle notes.

The *sativum* varieties do well in all climates. Called "softneck" or "artichoke" garlic, heads tend to be large, with 12 to 20 small cloves and no central stalk. Leaves, which sprout directly from each clove, are quite flexible and best for braiding. Generally, softneck garlic can be either pungent or mild, but lacks subtlety.

What to Do This Fall

For the biggest heads, always plant individual garlic cloves in fall. Each clove will form a new bulb by the next summer. Garlic thrives on spring and summer sun and moderately cool nights—it needs heat to form its bulb. Choose a site with deep soil rich in organic matter. Soil that has been built up with cover crops the previous year is ideal.

Before planting, add 1 to 2 inches of compost or well-rotted manure to a deeply cultivated plot. Garlic requires nitrogen to nourish fall root growth. I add nitrogen in the form of fish meal or alfalfa meal at a quarter- to a half-pound per 10-foot row. Organic soybean meal supplies slow-release nitrogen that lasts in the soil until bulb production takes place the next spring. Apply a half-pound per 10-foot row. (You can buy soybean meal, alfalfa meal and kelp meal at farm and feed stores.) The organic soil additive Azomite, a type of rock dust, has significantly increased the yield and size of my garlic crop. I add a half-pound per 10-foot row. If you can't find Azomite, kelp meal applied at the same rate can supply extra minerals.

Start with certified disease- and pest-free garlic from a reputable supplier. Make sure it has been tested to be free of garlic bloat nematode. If you plant infected cloves, the nematodes will colonize your soil. They kill garlic before the bulbs mature. Seed cloves are also vulnerable to *Penicillium* decay, a disease that appears as a bluish-green mass. Garlic may be susceptible to basal rot, white rot or botrytis rot (which is sometimes called





Plant garlic cloves at least 10 inches apart (above). After harvest, dry garlic for about three weeks in a shady spot (top right).



“neck rot”). Basal rot may cause yellowing and dieback of leaves, and may manifest as a white fungal growth at the bulb’s base. White rot causes fungal growth on the stem that extends around the bulb’s base, and afflicted bulbs will have a blackened neck with water-soaked outer scales. Botrytis rot causes water-soaked stems and gray, fuzzy fungal growth. Little can be done to control these diseases; you’ll need to pull affected plants.

Plant garlic four to six weeks before your ground freezes in fall. If your ground never freezes, plant a month before the coolest time of the year. Timing will determine the number of cloves in your garlic bulb. If you plant early, the garlic will set its roots into warmer soil and deduce that it has lots of nutrients available, and thus make plans to form more cloves. If you plant later, the garlic will perceive less nutrient availability and set fewer cloves. Both heads may grow to be the same size, but the later planting will have fewer, larger cloves.

To grow large heads, devote more planting space, as the roots of a well-developed garlic bulb can spread out 6 inches. Space garlic 10 inches apart in rows at least 1 foot apart. Plant individual cloves 2 to 3 inches deep, pointed end up. Garlic thrives on even, not-too-heavy moisture and prefers cool roots, so irrigate as needed and mulch deeply with straw, shredded leaves or hay. Mulch will also protect against frost heaving and smother weeds, which is important—garlic despises weed competition. Free up any spears that can’t pierce the deep mulch in spring.

What to Do Next Spring

In spring, I foliar-feed fish emulsion (1 tablespoon per gallon) every two weeks until scapes appear, or side-dress with blood meal (2 to 3 teaspoons per head) four to five weeks into the season.

Hardneck varieties will send up a scape a few weeks before harvest. Clip these stalks after they have emerged, before they curl. This will force the plant to put its energy into the bulb rather than scape formation. Don’t just toss the garlic scapes—find delicious ways to cook them at <http://goo.gl/2L7rMa>.

What to Do Next Summer

Wait until a relatively dry period, if possible, for optimal harvesting and curing. Dig garlic when the plant’s bottom leaves have yellowed. As the leaves die, layers of the papery “wrapper” around the bulbs will begin to decay, so harvest before you lose too many.



A garlic plant’s roots can spread as much as 6 inches underground (above). The author shows off a spectacular braid of prize-winning ‘Georgian Fire’ garlic (right).



To harvest, loosen soil with a fork, pull the bulbs from the ground and shake off the soil. Garlic bruises easily, so avoid banging the heads. The crop is also vulnerable to sunscald, so remove the heads to a shady spot.

Next, trim the tops and roots, and arrange the bulbs on racks to dry and cure. Or, leave the plants intact and hang in small bunches or spread on racks. I use room fans to dry my garlic crop quickly. After garlic is fully dry (in about three weeks), remove all remaining roots and gently brush off any lingering soil. Store garlic in mesh bags in a cool, dry, dark place. Storage longevity will depend on the variety, but will range from six to 12 months.

To save planting stock from your summer harvest, choose 2- to 2½-inch bulbs that have the variety’s best characteristics. Set aside the plumpest, largest cloves from within those bulbs to plant again in fall. Avoid double and sliver-like cloves, as the doubles will create a double bulb with a flat side, and the slivers will usually form a small bulb. 🌱

Roberta Bailey has grown garlic for decades on her 18-acre farm in Maine, which is surely a vampire-free zone by now.

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DIY Biodiesel

MAKE YOUR OWN FUEL

Rev up your self-reliant lifestyle by transforming used cooking oil into homemade fuel that can power any diesel vehicle.

By Lyle Estill

If you're steering your household toward a more self-sufficient lifestyle, maybe you'd like to add do-it-yourself fuel to your list of goals. Biodiesel can be brewed from waste vegetable oil or animal fats, which you can collect free from restaurants, or you can grow soybeans or canola to press your own oil. Process the oil with a couple of chemicals to produce homemade fuel that can run any device powered by petroleum diesel—including

pickups, cars and home heating systems. Do it right, and DIY biodiesel can cost as little as \$1 per gallon to manufacture. The scale is up to you: Brew enough to make your homestead fuel-independent, or join forces with neighbors to produce fuel for your collective households.

At minimum, the equipment you'll need for home biodiesel production is a stainless steel reactor tank, a wash station to remove the coproducts, and containers for storing the resulting fuel. You can rig up an electric water heater as a biodiesel

reactor for less than \$1,000, or spend about the same amount on a kit. If you'd rather opt for a ready-made, automated system, expect to pay \$10,000 or more.

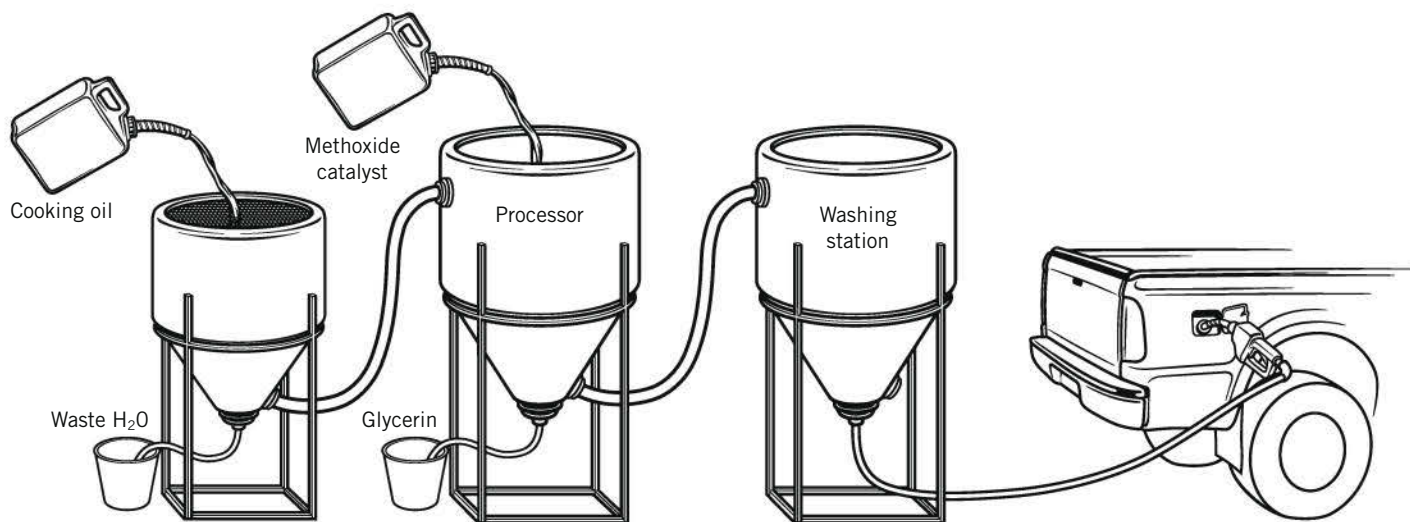
Safely making high-quality fuel in your backyard will take planning and work, but the freedom and moneysavings of driving down the road on fuel you've made yourself are hard to beat.

Good Chemistry

Biodiesel production is dependent on two chemical reactions. The first is



You can keep your diesel vehicle rolling on homemade fuel (left) produced in a compact biodiesel reactor made from an electric water heater (right).



Basic Steps to Biodiesel

1. Collect and filter used cooking oil, and allow unwanted water to settle and drain out. 2. Pump the oil into a processor and add a methoxide catalyst. Agitate the mixture and then allow it to rest. 3. The oil reacts with the methoxide to form biodiesel and a glycerin coproduct; allow the glycerin to settle and then drain it off. 4. Wash the biodiesel to remove impurities and it will be ready to use.

commonly called the **methoxide reaction**. It happens when you mix methanol with a catalyst, which can be either potassium hydroxide or sodium hydroxide.

The methoxide reaction is “exothermic,” meaning it gives off heat. Don’t use plastic vessels when creating methoxide. They don’t hold up well to heat and have a tendency to explode or dissolve because plastic can store a static electrical charge. Always opt for stainless steel equipment when making biodiesel.

Sodium hydroxide is commercially produced lye; both sodium hydroxide and potassium hydroxide are available online from suppliers of soap-making equipment. Procure methanol at your local chemical distributor or race car shop (race car drivers often blend methanol into their fuel supplies). In North Carolina, where I live, you can carry 100 gallons of methanol on your pickup truck without special permits or licensing.

After you’ve achieved a successful methoxide reaction, the second required process is the **biodiesel reaction**. This occurs when you mix methoxide with oil and agitate the molecules. The product of the biodiesel reaction will be a mix of about 80 percent biodiesel and a 20 percent cocktail of coproducts. You can either drain the coproducts off the bottom of your tank, or decant the biodiesel from the top of the tank.

Planning a Home Biodiesel Plant

Step one: Find a reliable source of feedstock. Try sourcing used cooking oil from restaurants, makeup manufacturers or nutraceutical companies. If you’re planning to sell your biodiesel, begin by analyzing the available feedstock supply, and make plans to size your operation accordingly. The commercial biodiesel landscape is littered

with the carcasses of producers who built to meet fuel demand only to find they couldn’t secure enough feedstock to make their biofuel plants work.

Most brewers who make biofuels for themselves (that is, not to sell) secure a source of used cooking oil from area restaurants as feedstock for their operations. While you can grow “virgin” feedstock (such as soybeans and sunflower seeds), waste vegetable oil works fine and is less expensive—just collect free or cheap cooking oil after it’s served its useful life in a restaurant’s deep fryer. A gallon of oil will yield about a gallon of biodiesel.

Step two: Build your plant, sized to your feedstock supply. A small home-brewing operation can fit in the corner of a garage, within the footprint of a single parking space. Allow enough space for a water heater, a tank for storing your incoming feedstock, and a tank for washing your fuel. For starters, aim to line up enough feedstock to meet your family’s fuel requirements.

If you’re collecting used cooking oil from restaurants, expect that 20 percent of the material you gather will be water and bits of fried food. Water is not your friend when making biodiesel, so you’ll need to remove it by heating the oil and allowing the contaminants to settle to the bottom before you pour



Commercial biodiesel is available, but you can save money by making your own fuel.

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Circle #17; see card pg 81



A Piedmont Biofuels staffer collects used cooking oil (left). Tennessee State University's mobile classroom teaches farmers how to make biodiesel (right).

the oil off the top. You'll have to devise a plan for disposing of the greasy wastewater. Pigs love it, and it improves their coats, so ask around to find a local farmer who will take it off your hands.

Safety First

Home biodiesel production is not without risks. Making your own fuel will require great attention to detail and safety because you'll be using chemicals

that are flammable and caustic. This article outlines the basics of how to make biodiesel, but you'll need to research carefully before you begin production. (See "Resources" on Page 57.)

Be sure to check with your local zoning department, too, to see whether you may face restrictions related to fuel production. Note that farms are exempt from zoning approval in many areas. You should also get in touch

with your area fire marshal or the local building inspection folks about fire-code compliance.

When designing your DIY biodiesel plant, be sure to devise a strategy for getting rid of coproducts before you begin production, because you don't want to end up with totes of methanol-laced glycerin piled up behind the barn. The cocktail produced by the biodiesel reaction tends to be filled with methanol,

JASON DE KOFF; LEFT: LYLE ESTILL

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Circle #47; see card pg 81

glycerin, free fatty acids and soaps. Because methanol is a microbial starter for digesters, some wastewater treatment plants will welcome it, as will some commercial-scale composters. Or, a friendly community biodiesel producer may accept it from you.

Biodiesel Diversity

Backyard biodiesel plants tend to be as diverse as the people who create them. Water heater tanks recycled into biodiesel reactors are common: Imagine an electric water heater, with a pipe plumbed to its outlet at the bottom, attached to a mixing pump that sends liquids to the top of the tank and back around again. Many small brewers cobble together their own vessels and pipes from scrap. Others order off-the-shelf parts or kits (see "Resources" at right).

Perhaps you'd prefer a biodiesel setup on the go. You and a group of neighbors can cooperate on a mobile biodiesel processor that can travel to

the feedstock source. Mobile processors tend to be significantly more expensive than fixed units set up in a garage, but they can offer regulatory flexibility. In my experience, local building authorities tend to ignore mobile processors, because they prefer to inspect units that are stationary. Mobile processors also offer the possibility of sharing a capital resource with other fuel consumers.

You can build a small-scale biodiesel plant on the back of a pickup truck for a couple thousand dollars. Outfitted with an 80-gallon reactor, such a plant could make enough fuel to meet a handful of families' biodiesel needs—assuming there's enough used cooking oil to feed and operate it. With free feedstock, \$1-per-gallon biodiesel could pay back the cost of the system quickly by providing enough fuel to keep everyone rolling. Find detailed instructions on making biodiesel in my book and in the other titles in the "Resources" box at right.

RESOURCES

BOOKS

Backyard Biodiesel:

How to Brew Your Own Fuel

by Lyle Estill and Bob Armantrout
(available on Page 72)

Run Your Diesel Vehicle on Biofuels

by Jon Starbuck and Gavin Harper

Biodiesel Basics and Beyond

by William Kemp

EQUIPMENT

Utah Biodiesel Supply:

www.UtahBio.com

B100 Supply: www.B100Supply.com

Springboard Biodiesel:

www.SpringboardBiodiesel.com

Lyle Estill is the founder of Piedmont Biofuels, a community-scale biodiesel plant in Pittsboro, N.C. He hasn't filled up at a local gas station since January 2002.



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COWS OR GOATS?

Pick the Right Dairy Animal for Your Homestead

Dairying is an udderly satisfying step on the path to self-reliance. We'll help you weigh the costs and time commitment needed to raise the two most popular milking animals.

By Jeannette Beranger
Illustrations by Liz Pepperell

Many people dream of having fresh milk from their own dairy animal. Their reasons range from the desire for self-sufficiency to the health benefits of the resulting dairy products to the pleasure of working with animals. But how can you determine whether dairying is an achievable goal for you? And whether a cow or a small goat herd would be a better fit for your farmstead? Let's find out.

Out to Pasture

The best-quality milk comes from animals raised on pasture, with supplemental feed to boost production. Both cows and goats need space to roam and won't be content in small enclosed areas. Be aware that your pasture may not provide sufficient forage year-round, and you'll need to feed hay during lean times.

For a cow and growing calf, a minimum of 2 to 5 acres of diverse, well-managed pasture is a must. If your available space is closer to 2 acres, select a smaller breed. Goats require much less space. Depending on the breed, four to five goats can thrive on 1 acre of land. They are mixed foragers and will happily browse on shrubs and trees in addition to pasture.

Protective Measures

A cow needs minimal cover in warm climates, but requires shade in extreme heat. A two-sided run-in shed with fabric cover is adequate and costs about \$600. In areas with harsh winters, a 10-by-10-foot loafing shed with three enclosed sides is sufficient to protect a cow from prevailing winds and extreme temperatures.

The cost to build this kind of three-sided shed with new materials will start at about \$700. Farm auctions frequently sell—or even give away—small outbuildings and reclaimed lumber for just a fraction of that. You'll also need a separate, sheltered space for milking that you can easily sanitize.

Goats dislike being wet and need shelter that's closed off to drafts. They require 12 to 25 square feet of shelter per animal, depending on climate, herd size and herd dynamics. In mild climates, they won't spend much time inside, so you won't need to provide as much room. In colder climates, though, you'll need to offer them as much space as possible. You can build a simple shelter and milking shed for several animals for about \$1,000.

During kidding or calving time, mothers also need quiet, private space for delivering their young. Consider using



Goats will respect a fence if they enjoy what they find inside. Forage pasture should be diverse, and shelter should be dry and clean.

a milking stand to help keep nervous or rambunctious animals still (see the illustration on Page 61). You can build a simple, inexpensive stand using plans widely available online.

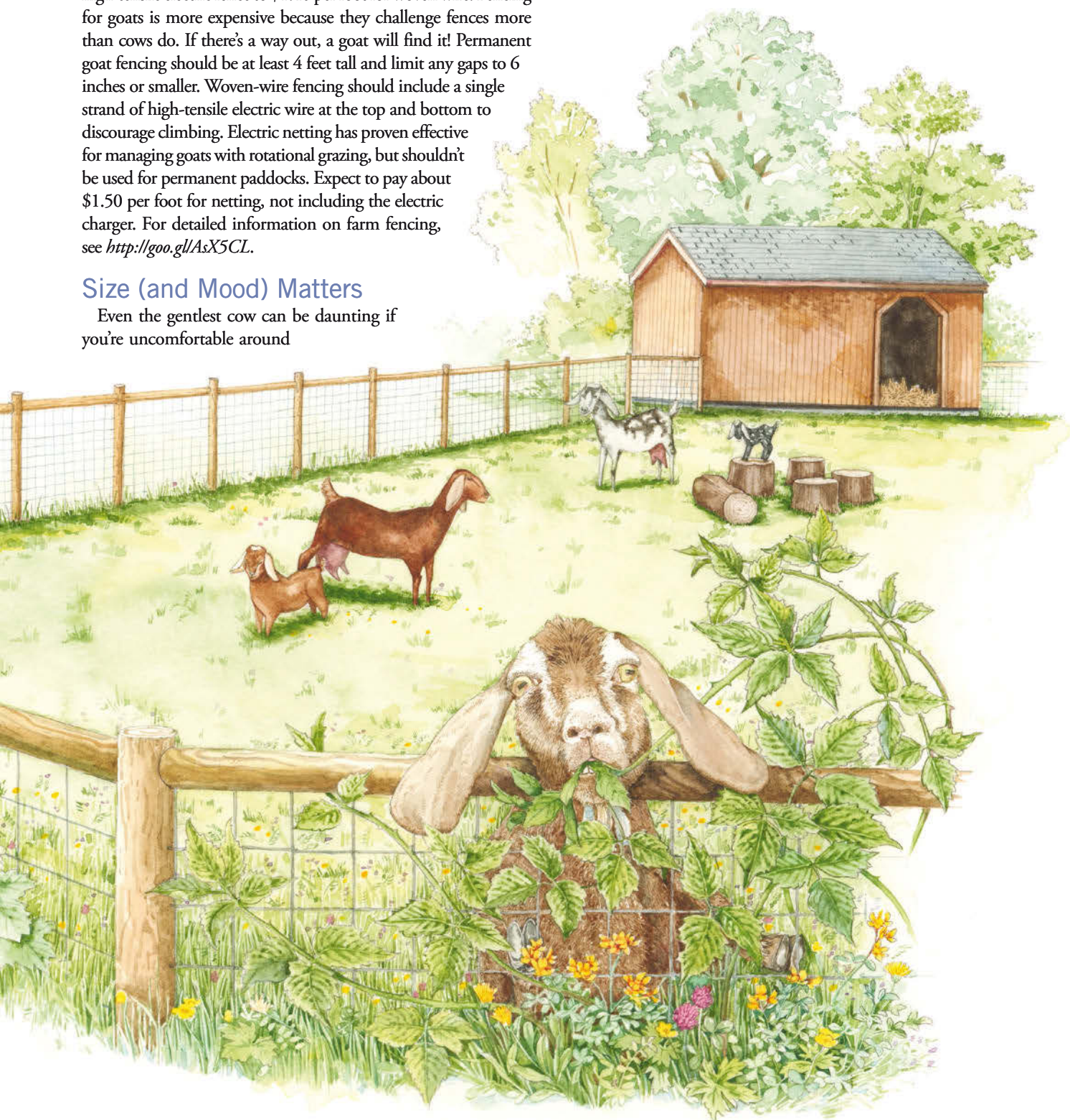
Sand makes excellent bedding for shelters with dirt floors, but must be 6 to 8 inches deep and cleaned several times a week. Deep, finely chopped straw or pine shavings may be used on cement floors but must be refreshed weekly.

Fencing materials for a cow will cost from 70 cents per foot for high-tensile electric fence to \$1.40 per foot for woven wire. Fencing for goats is more expensive because they challenge fences more than cows do. If there's a way out, a goat will find it! Permanent goat fencing should be at least 4 feet tall and limit any gaps to 6 inches or smaller. Woven-wire fencing should include a single strand of high-tensile electric wire at the top and bottom to discourage climbing. Electric netting has proven effective for managing goats with rotational grazing, but shouldn't be used for permanent paddocks. Expect to pay about \$1.50 per foot for netting, not including the electric charger. For detailed information on farm fencing, see <http://goo.gl/AsX5CL>.

Size (and Mood) Matters

Even the gentlest cow can be daunting if you're uncomfortable around

large animals. Smaller breeds of dairy cattle, such as Dexter, Kerry or Jersey, may be more approachable for those just getting their feet wet. Temperament varies greatly among breeds and individuals. When shopping for a family cow, look for a mild demeanor. If the animal was handled at an early age, it's more likely to have developed a good temperament. If you've never worked with a cow before, team up with an experienced hand who can teach you the basics.





Goats' smaller size may be more attractive to beginners, as they are easier to move and handle than a cow. Temperament can still vary, so pay attention to your dairy prospect's attitude. Goats are often nervous or flighty if they're not used to being close to people. Look for animals that have interacted frequently with people from an early age.

The Inevitable: Calves and Kids

Some people say they'd like to get into dairying because they don't want to raise meat animals. The reality is that you can't have dairy animals without offspring: Cows and does must deliver babies before they'll produce milk. Remember, half those kids or calves will be male, and not every female will grow into a great milker. Some female offspring may replace your aging dairy animals. A few may even become pets. But unless you have unlimited space, most must either be slaughtered for meat or sold. Selling this surplus stock will offset your production costs.

You have two options for breeding: artificial insemination or live animal breeding. Both are common, although with some heritage breeds, semen may be difficult to obtain. Males are a challenge to manage because they'll try to stay with the females, regardless of fencing. Keeping a male is usually impractical if you're raising only one cow or a small goat herd. The best approach is to borrow a male, or send your female to a nearby breeding farm. You'll risk bringing a parasite or disease back to your place, however, so make

sure the farm is well-kept and the animals are healthy. Artificial insemination may be the most practical option for a small homestead dairy, and your vet can provide this service or advise you.

Before the young are born, you'll need to consider several management methods. If you leave the baby with the mother full-time, almost all of the dam's milk will go to the baby. If the calf or kid nurses overnight but is separated from the mother in the morning, you'll need to milk only in the evening, and will collect about half the dam's production. If you separate them completely and bottle-feed the baby either the mother's milk or milk replacer, you'll need to milk twice a day. Smaller dairies lean toward the first two options. Decide early on which practice you'll follow so you'll have equipment and infrastructure at the ready.

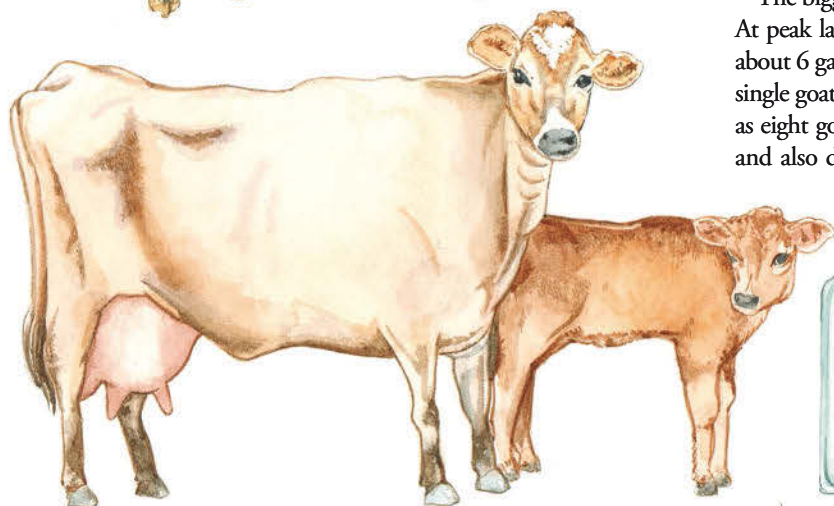
Cost Comparison

A good milk cow or goat should produce up to 10 months out of the year and will give milk into its teen years. Careful selection of good dairy bloodlines will pay off. A proven milker costs more, but the saved training time will be worth the added expense. Depending on the animal's breed, age, stage of pregnancy and the region you live in, you can expect to pay \$1,200 to \$2,500 for a dependable cow or \$250 to \$350 for a quality goat. Be cautious of a "good deal." Make sure you know the animal's health and production history before you buy. If you buy an animal that has already given birth and is lactating, the owner can give you a reliable estimate of the animal's future production.

The startup cost of equipment for dairying will vary based on whether you choose to hand-milk or use a mechanical milker. Hand-milking takes more time, but mechanical milking equipment is more expensive. Several types of hand-operated milkers, such as the Udderly EZ, are priced starting at about \$190. A new hand-milking kit, including a 3-gallon stainless steel bucket, a stainless steel storage can, a strainer with disposable milk filters, and a strip cup for checking foremilk, sells for about \$350. A new electric vacuum pump will cost about \$1,000, and the mechanical equipment it requires can double the price tag. Look for used equipment online, in classified ads, and at farm auctions.

Sweet Rewards

The biggest difference between cow's and goat's milk is volume. At peak lactation, if separated from her calf, a cow will produce about 6 gallons of milk daily, compared with 3 to 4 quarts from a single goat. This means that one cow will produce about as much as eight goats will. Volume varies among breeds and individuals, and also depends on the stage of each animal's lactation cycle,

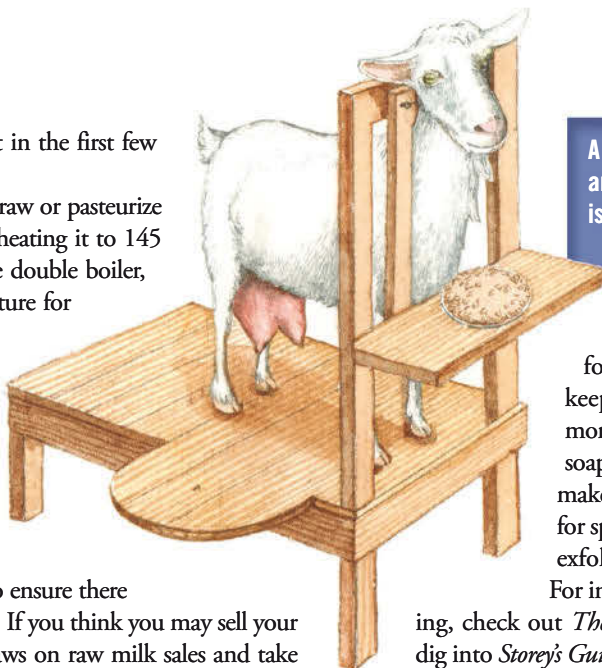


with production being highest in the first few months after giving birth.

You may consume the milk raw or pasteurize it on your stovetop by slowly heating it to 145 degrees Fahrenheit in a simple double boiler, and maintaining that temperature for 30 minutes. (You can find detailed instructions online at <http://goo.gl/khytttd>.) Raw milk has adamant supporters, but those promoting pasteurization are just as resolute. Thoughtfully weigh the decision to consume raw milk, and handle it carefully to ensure there is no chance of contamination. If you think you may sell your extra milk, learn your state's laws on raw milk sales and take care to protect yourself and your farm from liability.

For cream and butter production, cow's milk differs from goat's milk because the cream separates easily. Goat's milk requires a mechanical cream separator as the fat globules are too small to separate naturally. Both types of milk are fine for making yogurt, ice cream and cheese.

The sweeter side of dairy lies in caramel production, which is a great way to use up extra milk. Traditionally, *dulce de leche* or *cajeta* is a cow's or goat's milk caramel created by boiling down



A simple milking stand helps nervous animals (and milkers) feel at ease, and is easy to keep clean. Find our basic plans at <http://goo.gl/YEInB4>.

sweetened milk. It is often used as a dip for fruit or topping for desserts and will keep indefinitely in the refrigerator. Need more ideas? Use some extra milk to make rich soaps. You won't need much volume and can make multiple small batches with ingredients for specialized purposes, such as colloidal oats, exfoliants, herbal extracts and essential oils.

For in-depth information on homestead dairying, check out *The Small-Scale Dairy*. For more on goats, dig into *Storey's Guide to Raising Dairy Goats*. Both books are available on Page 72.

Whether you choose a cow or goats, thoughtful planning will help ensure a pleasant experience for you and your animals. 🌿

Jeannette Beranger is the research and technical programs manager at The Livestock Conservancy (www.LivestockConservancy.org). She managed cows and goats in New England for 17 years.

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Grow Your Farm DEBT-FREE

To ensure your business' success, grow slowly, live frugally, and borrow carefully—if at all.



In light of our modern love affair with fast growth and fast money, I'd like to propose embracing the opposite: As you grow your market garden or farm business, *slow down*. A debt-free farm is a thing of beauty—but you can't build it overnight.

A common business axiom is that financial collapse usually doesn't result from a poor product, poor marketing or poor service. Instead, collapse is frequently a consequence of a cash-flow crunch: A growing business is strapped for cash because accelerated sales require increased infrastructure and labor, which often must be paid for faster than the business's growth can afford. Before you know it, the business is mired in debt. With proper planning, however, you can avoid yoking your farm business or market garden to paralyzing debt.

My own trajectory as a farmer followed a path of slow growth and low debt. I'm nearly 60 years old; I started my first chicken enterprise when I was 10. When my wife, Teresa, and I review our current farm financials—our staff, infrastructure and expenses—we sometimes shake our heads and ask each other, "How did we get here?" We never planned or even expected to be at our current scale. The growth happened largely without debt, and the business developed so gradually, for the most part, that we didn't even realize where the trajectory was headed.

You could say it snuck up on us—over the course of 50 years.

Live Below Your Means

Nothing stimulates creativity and motivation like being poor and hungry do. Teresa and I had limited financial

resources—and I'm grateful for that. We both came from frugal families who always lived a little below their means. If every generation spends a little less than it makes and saves that surplus, wealth will accumulate. My dad and mom worked jobs away from the farm in order to pay for the land, but never made a living from the farm. At the time, the farm's gross annual income was just a couple thousand dollars.

Because their off-farm jobs paid for the land, Teresa and I were able to launch without a mortgage when we decided to farm. That was a huge blessing and leg up, but before anyone thinks this deal put us on farming's Easy Street, realize that every day, farmers who own their land or have inherited it still go out of business. Owning land does not necessarily lead to profitable farming.

RICHARD JEONG; TOP: TERESA SALATIN



By building the business slowly, Joel Salatin and his family have managed to keep Polyface Farms in Swoope, Va., free of burdensome debt.

We each brought some savings into the marriage and held off-farm jobs for a couple of years, until we had some money in reserve. In September 1982, I resigned from my position at the newspaper office, where I had been working as a reporter, to begin farming full time.

I was 25 years old, and nobody thought we'd succeed. But we knew that, as cheaply as we were living, we could survive for at least a year, even if the farm business didn't work out. How did we accumulate those savings on modest salaries? We drove a \$50 car. We remodeled the attic of the farmhouse into an apartment we rented out for extra income (we called it the "penthouse").

We never went hungry because we raised our own food. Teresa canned and froze our garden bounty, and our meals were simple, seasonal and substantial. We cut our own firewood. We never went out to eat, to movies or on vacations, and we didn't even have a television. (A cookout at the farm pond is still as relaxing and recreational as anything money can buy, and it's a lot cheaper.)

For a little extra money here and there, I helped neighbors build fence, plant trees, make hay. When you're living on \$300 a month, \$600 goes a long way. I guarantee you that we are making the most of those frugal years today because we didn't let our spending get ahead of us early on. By cutting back on living expenses, we didn't have to earn much from the farm. Eventually, all the belt-tightening added up.

Since then, we've been able to create a successful business, purchase an adjoining farm, and lease 10 pieces of land that are owned by people who inherited or purchased property but couldn't figure out how to make it profitable.



Joel Salatin with his mother, Lucille; his wife, Teresa; and two younger generations of Salatins who are carrying forward the farming tradition.

Control Your Business Growth

Through direct marketing, we developed a customer base of families in the community who wanted pastured meat and poultry. We wore the hats of producer, processor and marketer so we could set our own prices rather than cast our wares on the commodity table.

We realized that advertising is often expensive, with undependable results, so we opted to rely on relationships to sell our products. I put together a slide program about ecological, pastured livestock production and presented it to civic clubs in the area. We gave samples to prospective buyers, and we rewarded word-of-mouth evangelists with free products.



While in high school, Joel Salatin ran his own business selling butter, chicken and eggs at a local farmers market.

These strategies kept our growth gradual, but also helped us develop good spending habits. If we had grown faster, we wouldn't have developed the experience necessary for maintaining the integrity of our production. I've known numerous farmers who grew their farm businesses faster than their expertise, only to have their businesses collapse when disease or sickness hit, or they failed to keep up with orders. If you can't market and deliver one pig, you sure can't market and deliver a dozen.

Going from 50 to 3,000 laying hens entails exponentially more skill and management.


The problem with debt isn't that it's inherently bad, but that it can quickly spin out of control—and it can enable a business to outgrow the owner's knowledge, skill level and ability to produce. Suddenly, the operator is confronted with infrastructure limitations and challenges that go beyond his or her limited experience. At the same time, the cash overhead (debt payments, for example) rapidly escalates, and this squeeze can create a death spiral.

I encourage aspiring farmers to live in a tipi if they have to in order to stay out of debt, and to put every spare penny into their farms. Build a profitable farm business first. Do it on rented land.

Do it on a small scale. If you only have 2 acres, make the most of those before thinking about upgrading to a bigger acreage. Under intensive rotational grazing practices, 2 acres is enough for 500 laying hens, a milk cow or two, 30 honeybee hives, 500 broilers, 50 turkeys, \$20,000 worth of vegetables, and specialty fruits, such as blackberries, raspberries and strawberries. In Quebec, Jean-Martin Fortier, author of *The Market Gardener* (available on Page 72), provides an inspiring modern example of how you can gross \$120,000 on only about 2 acres of land.

Brand Spanking Old

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Circle #41; see card pg 81

In my experience, size is almost never the weak link keeping a small farming enterprise from being successful. The problem is constipation of the imagination—a lack of creativity, efficiency and business acumen. Fast growth won't fix any of these problems; it will only compound them. If you aren't successful managing a small number of acres or animals, why would increasing those numbers improve your situation?

If you're struggling to keep ahead of the chores on a small place, the problems will only multiply if you expand. If you can't successfully shepherd the birth of five calves, having a hundred births to manage will not suddenly make you a better farmer. If you can't manage your own time effectively, having more people to manage won't help.

Learn from Your Mistakes

Mastering any skill involves a learning curve. According to business guru Peter Drucker, the bottom part of that curve gets deepest in the fifth year or so of a new enterprise before the rise to success begins. In that valley, too many people either seek fast money or simply quit. The more practical and doable option is to persevere another year—learn from your mistakes, leverage your experience, and climb out the other side of the curve without being enslaved to big farm debt payments.

Impatience is not only costly; it's often deadly for small businesses. Enjoy the time it takes to develop skills and relationship intelligence, and realize that sometimes a successful farm business is a multigenerational endeavor. You might not be able to accomplish all of your goals in your lifetime. That's OK. Mentor someone who will take the vision and proceed, methodically and systematically.

Debt isn't evil, but it should be sought out judiciously, turned to as a last resort and used strategically. Through the years, we've received a few gifts and loans. We've borrowed, but only when we knew the payback would be quick and assured. Debt is a hard taskmaster. Deferred growth is sweeter than endless loan payments.

You never have to repay a loan you don't accept. If you want to expand, then be

We use what we have,
for as long as we can,
as frugally as possible.

creative enough to figure out how to make it happen without saddling yourself with burdensome debt. As my dad used to say, "We make haste slowly."

Seldom does a signed, sealed and delivered farming opportunity fall in anyone's lap. Even if you're starting with no money and no family resources, opportunities can open up for you, depending on the skills and confidence you've developed, and the track record you've created one manageable step at a time.

Ask yourself what you can do right now, right where you are, that will develop your knowledge base, build skills and help you determine the type of production you'd like to undertake. Then look for opportunity and be prepared to take the next step when you can do so in a sensible way. Everyone has a starting point; everyone has weaknesses and strengths. Is it more valuable to start with owned land, or with mechanical ability or marketing smarts? A more apt question might be, how do you leverage what you have within your own context?

"Profitable farms always have a threadbare look," says Allan Nation, editor of *Stockman Grass Farmer* magazine. When you visit our farm, you won't see fancy fences, spiffy buildings or expensive landscaping. We use what we have, for as long as we can, as frugally as possible. It'll never get us respect on Wall Street or Madison Avenue, but it lets us sleep soundly at night. And that makes us wealthy in the true sense of the word. 🌱

Joel Salatin slowly shepherds his farm business with his extended family in Swoope, Va. He is the author of *Fields of Farmers: Interning, Mentoring, Partnering, Germinating* and numerous other books about sustainable farming, some of which are available on Page 72.

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Circle #57; see card pg 81

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Circle #28; see card pg 81



DIY Leaf-Pattern Stepping Stones

I wanted to try using rhubarb leaves as a way to imprint concrete stepping stones—so I did!

All I needed was a large rhubarb leaf, a bag of inexpensive concrete mix, spray cooking oil, a piece of wire mesh, some sand, a piece of plywood large enough to use as a work surface, and a bucket with water for wetting the concrete mix.

I laid the plywood sheet in a shaded place, and then dampened the sand and gently spread it onto the sheet, taking care to cover a space slightly larger than the selected leaf. I added water to the concrete mix according to the directions. I then laid the leaf face-down on the sand and sprayed the back with cooking oil before covering it with 1 inch of prepared concrete. I patted it down to remove bubbles and then rounded the edges. To give it extra strength, I covered the damp concrete with a piece of 1/4-inch wire mesh before adding a second 1-inch layer of concrete. After patting down the second layer and rounding the edges again, I left the concrete to dry for several days. When it was dry enough, I overturned the stone and removed the rhubarb leaf with a soft wire brush. I also smoothed any remaining sharp edges. I let the stone dry completely before moving it to the yard. I've



made five of these garden stones now, and they've all survived two harsh winters without cracking or breaking.

*Lisa Facciponti
Saylorsburg, Pennsylvania*

Feeling Stumped? Find a Solution with Fungi

I suggest that folks with a troublesome tree stump call upon their mycelial friends.

First, make sure the stump is dead by waiting at least a month after cutting the tree. Create a few holes in the top of the stump using a drill or a wood splitter. Surround the stump with a waterproof "fence" that's about 2 feet higher than the top of the stump. Plastic 5-gallon buckets with the bottoms removed are great for small to medium stumps, and the top half of a plastic barrel works well for large stumps.

Next, collect moist, rotting mulch that's laced with white fungal mycelia. You can obtain this mulch from any decomposing wood material that has white strands visible on its dark, moist side. I collect this locally because I can see for myself that it's already been quietly working to turn wood into compost. Fill in the area between the stump and the fence with the mulch, and pack it lightly with your foot or a piece of lumber until it's completely covered. Give it one nice initial

soaking, and then periodically add water. You don't want the inoculated pile to dry out, but you don't want to turn it into a swamp, either.

You can give the rotting process a boost by adding a nitrogen source after the mycelium has had a chance to penetrate the new wood, which usually takes about three months. Mix a 1/2-cup of blood meal or fish emulsion, or a few scoops of chicken litter, into the wood mulch two or three times over the course of a year. Re-soak the mixture with water after each addition.

Within six months to a year, most stumps, regardless of species, will be easily workable. Remove the waterproof corral and mulch. Even if the nuisance stump hasn't totally disintegrated, it will at least be soft and spongy. Break any surface snags by whacking them a few times with the back of an axe or a sledgehammer. Pound the surface of the stump until it's level with the ground, and spread the mycelium mat around the area. Over time a hole will emerge as the stump continues to decay.

Large roots will also decay and possibly cause depressions. Be sure to fill in these depressions with dirt to prevent accidents.

*J. Dwaine Phifer
Cleveland, North Carolina*

Bedtime Snack for Hungry Chickens

I raise free-range chickens. I've found that if I place a small outdoor light close to the ground for a few hours each evening, bugs attracted to the light provide a feast for my chickens to enjoy.

*Nathan Roberts
Elberton, Georgia*

A Doggone Good Homemade Pet Collar

Do you need a good, inexpensive pet collar? If so, just purchase a leather belt from a thrift store and cut the belt to fit your pet's neck. Punch new holes as needed. Now you're ready for a tail-wagging adventure!

*Eileen Raymer
Ellsinore, Missouri*

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A Living Trellis Made of 'Mammoth' Sunflowers

I like to keep a continuous succession of crops in my raised garden beds. I have one bed with a permanent trellis for growing vining crops, and then I use plastic pipe to erect trellises in the other beds as needed. One summer, all the pipe was in use, and I wanted to get a fall crop of peas planted. Instead of buying more pipe, I decided to make a living trellis.

I planted a closely spaced row of 'Mammoth' sunflowers where I wanted the trellis. After a few weeks, the sunflowers were about thigh-high, so I planted my peas in between the fast-growing plants. By the time the sunflowers reached shoulder height, the peas had sprouted and were looking for something to hang on to. Not only did this make a cheap, attractive trellis, but that fall I had two successful crops instead of one!

Sweet Ideas for Sweet Corn

We asked members of our Facebook community how they prefer to cook and eat sweet corn, and their answers started cropping up before we could say, "Butter!" We've included some of our favorite ideas below for when your sweet corn crop is ripe for the pickin'.



- Corn tastes wonderful when grilled in the husk. When finished cooking, remove the husk and then smother the kernels in pesto. After you've had grilled corn with pesto, you'll never go back to butter. —*Diana Wise*
- Shuck the corn and rub the kernels with a little oil. Put the cobs directly on the grill until they brown a bit. Serve with butter that's been mixed with lime juice, cumin and chili powder, or plain old salt and pepper. —*B. Claire Grubb*
- Instead of spreading butter on grilled corn, try mayonnaise. Sometimes I also sprinkle on chili powder or smoked paprika. —*Jeff Butler*
- Eat sweet corn raw while standing next to the stalk you just picked it from. —*Gale Fiebig*
- Try corn on the cob covered in peanut butter and wrapped in bacon! —*Helena Bucket*
- I like sweet corn best when served without pesticides. —*Connie Harrell-Wold*
- Try to boil sweet corn within five minutes of harvesting. When it's finished cooking, dust the cob with shredded Parmesan cheese. —*Kate Tossey*
- Why destroy the poor thing? Just cut sweet corn off the cob and add the raw kernels to a taco or salad along with some salsa. Corn is sweet and crunchy when eaten raw. —*Jacqueline Jacie Hodge White*
- Soak sweet corn in water all day with the husks on, and then grill it. —*Tracey Preston*
- Mix cooked corn kernels into creamy mashed potatoes! —*Kriss Luckett-Ziesemer*
- Try grilled sweet corn with a squeeze of lime juice and a dash of salt. —*Lori L. Boden*
- When boiling sweet corn, add milk and butter to the stockpot. —*Carrie Lynne Gregg*
- Grill corn, and then top it with butter, Cajun seasoning, lime juice and *Cotija* (a hard, crumbly Mexican cheese). —*Jennifer Tippetts*
- Pull the husk back but keep it attached, and then wrap the cob in raw bacon. Pull the husk back up and then wrap the whole thing in foil with a little bit of water and steam it. The bacon flavor is so good. —*Dianna Kephart Wagner*
- I eat sweet corn plain, right out of a pot of boiling water. That's the tastiest and the healthiest! —*Laura Bougeois Dominguez*



This year, I started my sunflowers indoors. I transplanted them, and now have my spring pea plants climbing a living sunflower trellis. It works great for me!

*Mark Griffin
Apex, North Carolina*

LED Solar Lights for Emergencies

Not only are they eco-friendly, but the solar LED lights that hang from my porch rail are also helpful during emergencies. Plus, they're really cute and look like small canning jars with handles. The advantage of these lights compared with kerosene lamps is that they pose no fire hazard, and the house doesn't smell like gas or get unattractive soot stains.

When the power was out for two days, I brought these solar-charged lights inside at night. I installed small hooks in various rooms to hang them wherever needed, and

now I keep one permanently in my kitchen window to use as a night light. I also have a 16-foot rope of 50 sun-powered LED lights, and I placed it on my kitchen counter during the last power outage. I recently bought a string of hummingbird-shaped lights for the gazebo, and brought it in during power outages, too. These LED emergency lights look charming on the shower rod and they illuminate the bathroom until the electricity comes back on.

*Debbie Curtis
Ithaca, New York*

Compost Bins: The New Water Cooler?

At my office, I've placed an empty coffee container on the counter near the coffee pots in the kitchen. I encourage all of my co-workers to empty their brewed coffee grounds into the container instead of throwing them away. I also remind them



Chair Cushions with Country Charm

A few months ago, I was in a predicament. My cloth chair cushions looked awful—they were ripped and stained. I was embarrassed to have company over. I went to a big fabric store, but I couldn't find anything I really liked. The patterns were nice, but I'm a practical kind of gal and I was looking for something truly durable. I needed a cover that would repel spills and stains and wouldn't easily rip.

That's when I thought of feed bags! They're colorful, sturdy and waterproof. My husband loved the idea, so we started refinishing the chairs the next morning. We cut feed and seed bags about one-and-a-half times bigger than the chair cushions, and then centered them to our taste. We then stapled the bags over the old fabric. This project was simple and cheap, and I love the way the new seat covers add "country and color" to our kitchen. To watch a step-by-step YouTube video of us assembling the homemade seat covers, go to <http://goo.gl/6Wny6e>.

*Sandra Vail
Genoa City, Wisconsin*

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Circle #54; see card pg 81

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Circle #2; see card pg 81

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Country Lore

A Swingin' Scarecrow

We've found that a spreader bar from a hammock is perfect to use as the "arms" of a homemade scarecrow. Because it has so many holes, you can securely attach tin cans to make noise, along with aluminum pie plates and CDs to flash in the sunlight and startle the birds. Happy crow scaring!

*Leah Smith
Nashville, Michigan*



to put their banana peels, apple cores and other compostable items in the container after lunch. When the countertop compost bin is full, I take it home and empty it onto my compost pile. Some co-workers have even started bringing in their overripe fruits and vegetables from home! I share the bounty from my garden because their compost contributions help me grow delicious produce.

*Lisa Platschorre
Cedar Springs, Michigan*

Recycle Fabric by Making Homemade Hankies

When someone in our family tosses a cloth item, such as clothes or sheets, into the thrift store giveaway box, I inspect it for holes or stains, because our thrift shop will throw damaged items away. If necessary, I wash the pieces the thrift store won't accept, cut off any buttons to add to our repair bag, and set the cloth aside.

While I'm reading aloud to our five children, they use scissors to cut the old items into squares for the "Kleenex" basket. Sheets yield quite a few squares! We store the homemade tissues in a wire basket in the kitchen. I now have one less item to buy and we've found a second use for our "trash."

*Lauren Banta
Centerburg, Ohio*

freezers. Starting in early summer, we turn on one freezer and gradually fill it up. When it's full, we turn on the second and fill it. Midwinter, when we've eaten our way halfway through each, we consolidate the food into one freezer and turn off the other. By late spring we're usually only using our refrigerator freezer.

We keep track of what's in each freezer by using a dry-erase marker to draw a cross on each freezer's door, and then we make a list in each quadrant that specifies the food's availability and location inside the freezer.

*Linda Schmoldt
Portland, Oregon*

DIY Doormat from Old Plastic Sacks

I turn plastic into excellent DIY doormats. I use newspaper bags, bread wrappers and anything flexible that can be cut into strips. A 3-by-4-foot mat requires approximately 50 newspaper bags to make.

Other than the bags, a big, fat crochet hook, some time, and a little creativity is all you'll need to make an upcycled plastic rug. Use any basic mat or rug pattern, and remember that no one will check your work for mistakes.

*Audrey Lowman
Norman, Oklahoma*

Increased Freezer Efficiency

We have a bountiful garden and freeze a lot of our produce. We also go to local farms to pick large quantities of fruit for freezing. Rather than use one upright freezer that would often be only partially filled and lose cold air every time it's opened, we purchased two small chest

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Circle #53; see card pg 81



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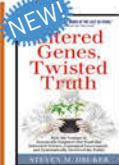
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real food



ALTERED GENES, TWISTED TRUTH

This book tells the fascinating and shocking story of how the massive enterprise to restructure the genetic core of the world's food supply came into being, and how it advanced by consistently violating the protocols of science. *Altered Genes, Twisted Truth* reveals the decades-long history of hundreds of eminent biologists and esteemed institutions systematically contorting the truth in order to conceal the risks of its GM products.

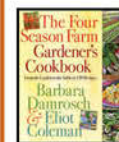
#7658 \$21.95



ON FOOD AND COOKING

Author Harold McGee's *On Food and Cooking* is the tome to which food lovers and professional chefs worldwide turn for an understanding of where different foods come from, what exactly they're made of, and how cooking transforms them into something new and delicious. This book is an invaluable and monumental compendium of basic information about ingredients, cooking methods, and the pleasures of eating. It will delight and fascinate anyone looking to deepen their culinary skills and knowledge.

#7660 \$40.00



THE FOUR SEASON FARM GARDENER'S COOKBOOK

The Four Season Farm Gardener's Cookbook is two books in one. It's a year-round, seasonal cookbook with 120 recipes to maximize the fruits (and vegetables!) of your gardening labor. It's also a step-by-step garden guide full of easy-to-follow instructions and plans for different gardens. It covers properly sizing a garden, nourishing the soil, and the importance of rotating crops and planning ahead.

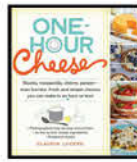
#6545 \$22.95



APPLES OF NORTH AMERICA

Beyond the polished and predictable grocery store display of 'Red Delicious' and 'Granny Smith' apples, a veritable treasure trove of beautiful and uniquely flavored North American varieties awaits the curious. There is no better person to bring you into this world than Tom Burford. His book is brimming with beautiful portraits of heirloom and modern apples of merit, each accompanied by distinguishing characteristics and common uses. *Discount available until September 30, 2015.*

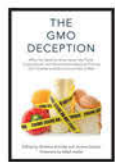
#7216 ~~\$29.95~~ \$22.46



ONE-HOUR CHEESE

It's a DIY cook's dream come true: It's pizza night, and you've made not only the crust and sauce, but the mozzarella, too. Or, you're whipping up quesadillas for a snack, using your homemade Triple Pepper Hack cheese. This book includes 16 recipes for fresh cheeses that can be made in an hour or less, using readily available ingredients and tools. And, they'll be just as delicious as store-bought!

#7407 \$14.95



THE GMO DECEPTION

Most of the processed foods on supermarket shelves (75 percent!) contain genetically engineered ingredients. *The GMO Deception*, an informative book from the Council for Responsible Genetics, gathers the best, most thought-provoking essays by the leading scientists, science writers and public-health advocates on the subject. This definitive work encourages us to think about the social, environmental and moral ramifications of where this particular branch of biotechnology is taking us, and what we should do about it.

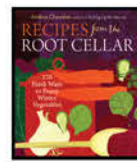
#7336 \$24.95



MEALS IN A JAR

Meals in a Jar provides step-by-step, detailed instructions for creating all-natural breakfast, lunch and dinner options that you can keep on a shelf and prepare in minutes. These scrumptious recipes allow even the most inexperienced chefs to serve delicious dishes. Not only are these meals perfect for after-school study sessions and rushed evenings, they also make for tasty fare on family camping trips and can be lifesavers in times of disaster.

#6657 \$15.95



RECIPES FROM THE ROOT CELLAR

Sweet winter squash, hardy greens, jewel-toned root vegetables, and potatoes of every kind make local eating easy and delicious, even in cold winter months. Whether these vegetables are gathered straight from the garden, from a well-tended root cellar or from the market, this recipe collection will help their delectable flavors and nutritional benefits pack a powerful punch.

#4557 \$18.95



HOME CHEESE MAKING

Discover 75 recipes for making your own cheeses, such as mozzarella, cheddar and gouda, and other dairy products that require basic cheese-making techniques and the freshest of ingredients. While offering the satisfaction of turning out a coveted delicacy, *Home Cheese Making* also features recipes for cooking with cheese, including sweet treats, such as Ricotta Pancakes, Cream Cheese Muffins and more.

#1660 \$16.95



organic gardening



EDIBLE LANDSCAPING

Rosalind Creasy's expertise on edibles and how to incorporate them into beautifully designed, outdoor environments was first showcased in the original edition of *Edible Landscaping*, hailed by gardeners as a game-changing classic. Drawing on the author's decades of research and experience, this new edition presents everything you need to know to create an inviting home landscape that will yield mouthwatering vegetables, fruits, nuts and berries.

#4565 \$39.95



THE GARDEN PRIMER 2ND EDITION

The most comprehensive and entertaining single-volume gardening reference ever printed now focuses on 100 percent organic methods. This updated version of Barbara Damrosch's classic guide rejuvenates the original material while maintaining its primary appeal: practical, creative ideas and the friendly style of an "old-fashioned dirt farmer."

#3896 \$18.95



THE TAO OF VEGETABLE GARDENING

In her latest book, groundbreaking garden writer Carol Deppe focuses on some of the most popular home garden vegetables—tomatoes, green beans, peas and leafy greens—and through them illustrates the key principles and practices that gardeners need to know to successfully plant and grow just about any food crop.

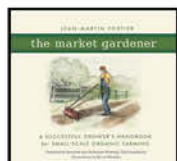
#7545 \$24.95



FOUR-SEASON HARVEST

If you love the joys of eating home-garden vegetables but always thought those joys had to stop in fall, this book is for you. Eliot Coleman shows how North American gardeners can successfully use winter sunshine to raise a wide variety of traditional cold-hardy vegetables in backyard cold frames and plastic-covered hoop houses without supplementary heat. *Four-Season Harvest* will have you feasting on fresh produce from your garden all through winter.

#538 \$24.95



THE MARKET GARDENER

Growing on just 1½ acres, micro-farm owners Jean-Martin Fortier and Maude-Hélène Desroches feed more than 200 families by selling through their thriving community-supported agriculture (CSA) program and seasonal market stands. Fortier shows by example how to start a market garden and make it both productive and profitable without working a large acreage. This book is a compendium of his farm's proven horticultural techniques and innovative growing methods.

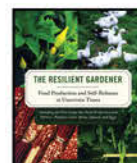
#7049 \$24.95



SMALL-SPACE VEGETABLE GARDENS

Small-Space Vegetable Gardens explains the basics of growing a bounty of edibles in a minimal amount of space. Andrea Bellamy also highlights the top 60 compact edible plants and offers complete information on how to sow, grow and harvest them. This detailed and enthusiastic guide teaches gardeners how to take advantage of the space they have—whether it's a balcony, a patio, a plot in a community garden or even a small yard—to create the food garden of their dreams.

#7614 \$19.95



THE RESILIENT GARDENER

The Resilient Gardener is both a conceptual and hands-on gardening book, and it is suitable for gardeners at all levels of experience. Resilience here is broadly conceived and encompasses a full range of problems—from personal hard times, such as injuries, family crises, financial problems, health problems, or special dietary needs (gluten-intolerance, food allergies, carbohydrate sensitivity or a need for weight control) to serious regional and global disasters, such as climate change.

#4809 \$29.95



WEST COAST GARDENING, 2ND EDITION

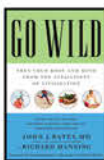
Linda Gilkeson's book contains everything an organic gardener in the Pacific Northwest needs to know to properly manage pests, diseases and weeds for vegetable and fruit gardens, lawns, roses and other ornamentals. Completely revised and expanded, this edition features more than 140 detailed entries (including 35 insects and diseases new to this edition). Updated information guides the reader through safe, effective methods, and the book's companion Web pages display the color versions of more than 200 illustrations—as well as additional photographs of pests and diseases.

#6548 \$28.00

To order, call toll-free 800-234-3368 (outside the United States and for customer service, call 785-274-4365), or go to www.MotherEarthNews.com/Shopping. Mention code MMEPAF82.



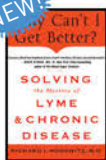
natural health

**GO WILD**

Harvard Medical School Professor John Ratey, M.D., and journalist Richard Manning investigate the power of living with awareness of our genetic makeup when making choices in the areas of diet, exercise, sleep and more. *Go Wild* examines how understanding our core DNA will help us combat modern disease and psychological afflictions, from depression to diabetes.

#7449 \$27.00

NEW!

**WHY CAN'T I GET BETTER?**

Cutting through the frustration, misinformation and endless questions surrounding Lyme disease and other chronic illnesses, Dr. Richard Horowitz's enlightening story of medical discovery, science and politics is an all-in-one source for patients to identify their own symptoms and work with their doctors for the best possible treatments and outcome.

#7659 \$29.99

**WHY WE GET FAT**

Gary Taubes (author of *Good Calories, Bad Calories*) reveals the bad nutritional science of the last century—none more damaging or misguided than the “calories-in, calories-out” model of why we get fat—and the good science that has been ignored. He also answers the most persistent questions: Why are some people thin and others fat? What roles do exercise and genetics play in our weight? What foods should we eat and what foods should we avoid?

#6881 \$15.00



homesteading and livestock

**THE SMALL-SCALE DAIRY**

The Small-Scale Dairy includes everything you need to know in order to successfully raise milking animals to produce nourishing, nutrient-rich, farm-fresh milk. Applicable to keepers of cows, goats or sheep, this book offers a holistic approach that explores the relationships between careful, conscientious management and the production of safe, healthy and delicious milk. Included are options for designing a well-functioning small dairy, choosing equipment, and understanding myriad processes—such as the use of low-temperature pasteurization where raw milk sales are prohibited.

#7045 \$34.95

**BUILD YOUR OWN BEEKEEPING EQUIPMENT**

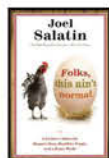
Beekeeping equipment is expensive, but you can easily and cheaply make your own! Tony Pisano's step-by-step, illustrated instructions show you how to build everything you need, including hive bodies, supers, covers, hive stands, frames, swarm catchers, feeders and more. You can choose from different hive styles, and many of the 35 projects require only hand tools.

#6730 \$19.95

**COUNTRY WISDOM & KNOW-HOW**

This 476-page book is a compendium of small booklets published as “Country Wisdom Bulletins” in the 1970s. Whether you want to build a stone fence, make strawberry-rhubarb jam or plant an herb garden, this book will explain how to make your homesteading dreams a reality.

#2793 \$19.95

**FOLKS, THIS AIN'T NORMAL**

In *Folks, This Ain't Normal*, Joel Salatin discusses how far removed we are from the simple, sustainable joy that comes from living close to the land and the people we love. Salatin has many thoughts on what “normal” is, and shares practical and philosophical ideas for changing our lives in small ways that have a big impact.

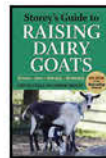
#5743 \$25.99

NEW!

**GRIT'S GUIDE TO MODERN HOMESTEADING**

Grit's Guide to Modern Homesteading walks you through finding, buying and building your dream homestead. From selecting that perfect piece of land to building your dream home and buying and raising livestock, this 100-page guide is filled with articles written by top homesteading experts.

#7643 \$6.99

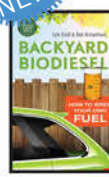
**STOREY'S GUIDE TO RAISING DAIRY GOATS**

Milk goats are a great choice for the small-scale dairy farmer. They require a smaller investment than cows and produce milk that is great for making delicious yogurt and cheeses. This thoroughly revised fourth edition gives you everything you need to know to raise dairy goats, including more information on pygmy goats, updated information on disease diagnosis and treatment, and expanded information on breeding, milking, dairying and cheese making.

#4647 \$19.95



green transportation

**BACKYARD BIODIESEL**

While small-scale, home biodiesel production can't save the world, this unique renewable fuel is economical, fun to make, better for the environment than fossil fuels, and will help you reduce your dependence on Big Oil. Designed to be accessible to everyone, from readers with no prior technical expertise to alternative-energy buffs, *Backyard Biodiesel* is a must-read for any aspiring fuel brewer, packed with everything you need to get up and running quickly and safely.

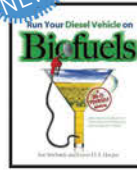
#7551 \$24.95

**MOTHER EARTH NEWS GUIDE TO GREEN CARS**

Just how high will gas prices go? Nobody knows, but you can save money on gas now and find the right fuel-efficient vehicle for your needs via our 2012 *Guide to Green Cars*. With reviews of more than 50 cars that get 35-plus mpg, proven tips for maximizing mpg, and articles on hybrid, electric, clean diesel and flex-fuel vehicles, this 100-page special issue will be an invaluable resource whether you need a new ride now or down the road.

#6027 ~~\$6.99~~ \$5.00

NEW!

**RUN YOUR DIESEL VEHICLE ON BIOFUELS**

Read about how to make the switch from expensive, environment-damaging carbon fuel to cheap (and, in many cases, free), clean fuel for your vehicle. Inside, you'll find step-by-step instructions accompanied by helpful illustrations for, among other projects, building and properly using a homemade biodiesel reactor. You'll be able to drive your car on vegetable oil—purchased at a fraction of the price of gas—or even on second-hand oil obtained from restaurants, free of charge.

#7661 \$27.00



green homes

**COMPACT CABINS**

Author Gerald Rowan presents 62 designs for cabins ranging from 100 to 1,000 square feet, all of them affordable, comfortable and energy-efficient. For every design, you'll find floor plans and detailed, innovative suggestions on how to take advantage of every square inch. The plans are flexible, featuring modular elements that can be mixed and matched to suit your specific needs.

#4436 \$19.95

CLEARANCE

**LOSING OUR COOL**

In *Losing Our Cool*, scientist and environmental journalist Stan Cox shows that indoor climate control is colliding with an out-of-control outdoor climate. Reporting from some of the world's hot zones—from Arizona and Florida to India—Cox documents the surprising ways in which air conditioning changes the human experience. Thought it can save lives in heat waves, it may also be altering our bodies' sensitivity to heat and our rates of infection, allergy, asthma and obesity.

#4713 ~~\$24.95~~ \$13.42**TINY HOMES: SIMPLE SHELTER**

Many people are rethinking their ideas about shelter, seeking an alternative to high rents or lifelong mortgages. This stunning book spotlights 150 builders who have taken things into their own hands by creating tiny homes (less than 500 square feet). Illustrated with 1,300 photos, *Tiny Homes* reveals a rich variety of small, homemade shelters and shares the stories of owner-builders on the forefront of the new trend toward downsizing and self-sufficiency.

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Confirmed by Los Alamos & Lawrence Livermore scientists to *The Washington Times* measured by SEM (ordinary distilled at 101° is the worst along with a "Free Water Report" scam by one of five companies cited by the Consumer Product Safety Commission). Anything at 108° (alcohol) or above will go through your skin! Measuring the ability of blood (94% water) to go through a membrane. Take a look at these verified claims . . .

1 Increases Blood Flow to the extremities measured by Doppler Ultrasound (M.D. independent Research at UCLA Medical). Typical Diabetic: "I soaked my foot in your water and it went from black to rosy pink saving my foot from last minute amputation!"

2 DISCOVERY by an 80-year-old retired professor (TWO MIT Chemical Engineering Degrees): "I put the water on my shiny dome AM and PM. In 2-3 weeks starting with some light fuzz, I now have a full head of hair with the fuzz gradually turning dark!"

3 EBOLA: "Working both inside and outside the hospitals" in Africa resulted from a humanitarian gift!

4 I ranked #1 in the world in the Discus in 1957 (*Track & Field News*, Vol 10 No 12) but gave it up because I knew FDA-approved anabolic steroids (now banned) would damage



the heart! I was right and now most of my friends are DEAD, like the inventor who died at 62 after damaging his own heart: "After the abuse by athletes, I wish I never invented anabolic steroids!"

5 ENERGY: Like Electrolysis, the body uses ENERGY to split water into hydrogen and oxygen. At a 114° HBA, it takes very little en-

ergy which means the immune system has more energy to fight disease!

6 ELECTROLYSIS: With the camera on the ammeter, it took only 10 DROPS of this water (added to one quart of ordinary distilled) to go down from 31 amps to less than 1 AMP while making the SAME AMOUNT OF HYDROGEN! The key to free energy to heat your home, produce electricity and power your car for pennies!

7 "UNTREATABLE" WASTE LAGOONS: Five-acre municipal lagoon La Salle, Colo. (letterhead) "Only 1,000 gallons got rid of the smell of 10 million gallons of e-coli!" TREAT WELLS, RIVERS & STREAMS!

8 DOLE FOODS: Ordinary water grows mold spores from the soil on fruits and vegetables. After nine months of testing, a seven-page contract!

Use it on your rugs, furniture and walls! At 85 (it's a family business), my Living Water Environmental Foundation will be here to maintain the health of our customers 100 years from now! All claims are made for the WATER not "a machine device" adjusted at the factory. Thirteen Patents, 332 FDA Tests

www.watercuresanything.com/RonaldReaganStory

Gilbert Daunant [Prince Rainier's cousin]: "I just walked 40 blocks and I am 95! Send another E5 to Monaco!"

Circle #16; see card pg 81

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Is Steam Canning Safe?

Last year, I used a steam canner for preserving produce. I've heard that the U.S. Department of Agriculture doesn't consider steam canners safe, however—is that true?

An atmospheric steam canner is a two-part pot with an inner rack for holding jars and a tall cover that allows a steady stream of steam to flow around the jars. It requires only about 2 quarts of water to process seven 1-quart jars of high-acid foods, whereas a water bath canner requires about 2½ gallons of boiling water to do the same job. A steam canner saves significant time and energy, doesn't emit as much heat, and requires less heavy lifting compared with using a water bath canner.

For more than a decade, information on the safety of steam canning has remained incomplete. But researchers from the University of Wisconsin, Madison, funded by a grant from the USDA and the National Center for Home Food Preservation (NCHFP), have now concluded that steam canners can be as safe and effective as water bath canners when properly used to preserve acidified or naturally acidic foods. They released the following guidelines for safely operating a steam canner for home food preservation:

- 1. Only steam can foods high in acid, with a pH of 4.6 or below.**
- 2. Always use a research-tested recipe developed for a water bath canner.** Acquire recipes from university extension programs or from the NCHFP (NCHFP.UGA.edu). The booklets that accompany steam canners usually don't provide safe instructions.
- 3. Heat jars prior to filling them with food, and minimize the amount of cooling time that passes prior to processing.** You can use half-pint, pint or quart jars.
- 4. Process jars only after the temperature reaches pure steam at 212 degrees Fahrenheit.** Wait to start the processing time until the canner has vented and a full, steady column of steam appears. Monitor the temperature with a thermometer.
- 5. Modify processing time for elevation**—in general, add 5 minutes for each 1,000 feet you're above sea level in elevation.



Follow these guidelines to let off some steam while preserving your bounty.

- 6. Only use recipes that require 45 minutes of processing time or less,** as the amount of water in the canner may not last any longer. Don't open the canner to refill the water while processing foods.
 - 7. Cool the jars in still, ambient air.** Cool jars on a rack or towel away from drafts. Don't place them in the refrigerator to hasten the process.
- Steam canners usually have ribbed bottoms, so they shouldn't be used on glass-topped stoves. Also, don't use steam canners in place of pressure canners, which seal in pressurized steam to achieve the high temperatures needed to safely can low-acid vegetables and meats.

—Barbara Pleasant

Why You Might Need Iodized Salt

Should I buy iodized salt?

Without knowing your location or diet, my answer is a qualified “yes.”

We obtain iodine from food grown in soils that contain it, but large areas of the world's soils lack sufficient iodine. So, seasoning your food with iodized salt is the best way to be sure you're getting as much of this essential nutrient as you need.

Iodine has one main function in the body: The thyroid gland, a butterfly-shaped gland nestled at the base of the throat, needs it to make thyroid hormones, which affect every cell in the body by regulating metabolism. They're also critical to optimal growth and development, including that of the skeletal and central nervous systems in fetuses and infants. According to the National Institutes of

Health, iodine may also have a positive effect on immune function and in preventing fibrocystic breast disease.

If a person becomes iodine-deficient, his or her thyroid gland will enlarge to form a “goiter.” Other symptoms of an underactive thyroid, called hypothyroidism, include fatigue, constipation, cold intolerance, depression, dry skin and hair, weight gain, and muscle weakness. In 1924, the iodization



of table salt in the United States successfully addressed deficiencies caused by the consumption of foods grown in soils lacking in iodine. Before that, illnesses due to iodine deficiency were widespread throughout the Great Lakes, Appalachians and Northwestern regions—known as the “goiter belt.”

If a woman is iodine-deficient during pregnancy, her infant may have mental disabilities, stunted growth, and problems with

speech and hearing. In fact, the World Health Organization calls iodine deficiency the most preventable cause of brain damage. Mild iodine deficiency has also been linked with attention deficit disorder.

While the typical U.S. diet contains a lot of salt in the form of processed foods, these foods are mainly made with non-iodized salt, according to the Office of Dietary Supplements. Table salt is thus the main source of iodine in most

U.S. diets. (The label will specify whether the salt is iodized.) A half-teaspoon of iodized table salt contains about 140 micrograms of iodine. Adults need 150 micrograms a day. Requirements rise to 220 micrograms during pregnancy and 290 micrograms while nursing.

Reliable dietary sources of iodine include saltwater fish, shellfish and seaweed. Breads and other grains often contain iodine as well.

—Linda B. White, M.D.

Is Bamboo Flooring Really Green?

I'm considering installing bamboo flooring, but I'm finding conflicting claims about it. Is this type of flooring truly a sustainable selection?

Bamboo flooring is often sold as a “green” flooring option, but the truth of this claim depends on which criteria you consider.

Processing raw bamboo into flooring involves kiln drying, boiling (sometimes twice) and often steaming. All of these processes are energy-intensive. Reliable embodied energy data for bamboo flooring is lacking, making it difficult to accurately compare bamboo to alternatives. But given the need for two to four high-heat processes, the production of bamboo flooring likely uses more energy than that of wood floors. Shipping bamboo materials from Asia can add to bamboo's total energy footprint, sometimes significantly.

Bamboo flooring is made from laminated strips of bamboo bonded with chemical glues. Surface finishes are also chemical composites. Depending on the type of binders and finishes used, some bamboo flooring can emit high levels of volatile organic compounds (VOCs) and other toxins.

Most bamboo flooring companies claim their flooring is much harder and therefore more durable than hardwood, such as oak. Some bamboo flooring *does* score high on the Janka hardness test. However, the Janka test protocol doesn't necessarily predict actual

wear and tear on a floor, and experience has shown that bamboo floors have real-life wear characteristics that are so similar to hardwood that bamboo can't prove a true durability advantage.

Proponents of bamboo flooring say it has a minimal environmental impact, pointing to the crop's fast growing cycle and rhizomatous root system that doesn't require replanting and helps control soil erosion after harvesting. Bamboo fans also claim that growing bamboo doesn't require chemical fertilizers, pesticides and herbicides.

Not all bamboo made into flooring can lay claim to those attributes, however. Increased demand for the flooring material has resulted in a rapid movement away from mixed forests of naturally occurring bamboo to large monoculture plantations. Plantations prompt concern over significant soil erosion, and, in reality, do often require fertilizers, pesticides and herbicides to sustain the monoculture in the absence of natural ecosystem controls. In addition, forests are being clear-cut to make way for bamboo, which results in habitat destruction and loss of biodiversity.

Chances are, the cheapest bamboo flooring is cheap for a reason: It's more expensive to harvest, process and finish a material to high environmental standards. But you can find truly green bamboo flooring if you search for it.

Choosing bamboo flooring that meets the FloorScore standard—developed by Scientific Certification Systems and the

Resilient Floor Covering Institute—will help ensure your choice is healthy in terms of indoor air quality. Buying bamboo certified by the Forest Stewardship Council (FSC) will also help you know you're purchasing responsibly. Keep in mind, however, that FSC certifies some monoculture plantations—and in those cases, even if the plantations use sound practices, much of the environmental damage would have already occurred. Ask questions and research options to find out whether the bamboo you're considering came from a monoculture operation or a more diverse, sustainable forest.

The Rainforest Alliance and the Sustainable Agriculture Network are both working to develop standards that will address issues with bamboo production, and, after they go into effect, these certifications will further assist consumers.

—Chris Magwood



Bamboo flooring may not always be as eco-friendly as dealers claim.



Beans, beans, the magical fruit—what's the best way to reduce the "toot"?

Bean 'Dip'

Do I need to soak my beans before cooking them?

You don't *have* to soak legumes before preparing them in a dish, although soaking beans will enable them to cook about 25 percent faster.

A widespread culinary conviction asserts that soaking beans will make them more digestible by breaking down complex carbohydrates in the bean to form more readily digestible carbohydrates—thus reducing flatulence. According to food scientist Harold McGee's *On Food and Cooking*, this commonly used method does cut back on the gas—but it also leaches out some of the beans' flavor and nutritional benefits, such as vitamins and antioxidants.

So, instead of pre-soaking, if you have the time, avoid throwing the nutrients out with the bean water by simply cooking dry legumes a little longer. Doing so will help break down the complex sugars while retaining the nutrients, flavor, color and antioxidants to boot. Cover the beans with just enough water—about 3 parts water to 1 part legumes—for the beans to soak up as they cook; any more and the extra water will still wash away some nutritional perks.

Always cook beans, especially kidney beans, until they're fully tender; undercooked beans can cause illness. To avoid that danger, pre-cook beans before adding them to dishes that will simmer in low-temperature slow cookers. Learn more about safely cooking beans at <http://goo.gl/8z7cDD>.

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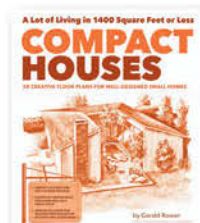
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Circle #56; see card pg 81




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Circle #63; see card pg 81

(CONTINUED FROM PAGE 8)

returned to its original condition as per the documents of the association.”

The garden in question is a vegetable garden I started four or five years ago and expanded two years ago. I grow peppers, herbs, tomatoes, cabbage and lettuce. The garden is lined with flowers to attract bees and butterflies, and to make it more attractive. Our HOA documents do not prohibit me from having a vegetable garden, nor do they dictate which plants I can grow or how my front yard's landscaping should look, except to require that it be kept up. Local regulations don't prohibit me from growing vegetables, either. My backyard is neither large enough nor sunny enough to grow vegetables, so moving my vegetable garden there isn't an option.

I particularly love the “return to the original condition” part of the notice. Association documents don't specify what the original condition of the front yard was, nor is there any consistency in the neighborhood. Some people have rock gardens and others have flowers. Some neighbors have shrubs and others have nothing but grass.

I plan to fight the homeowners association. If I need to fight for legislation that protects my right to use my property as I see fit, then I shall do that, too.

*Darrell Brock
Coconut Creek, Florida*

Thanks for writing, Darrell, and good for you! To learn more about this issue, see “Fight for Your Right to Grow Food” at <http://goo.gl/E7x98d>. — MOTHER



Darrell Brock is pushing back against orders to remove his front yard garden.

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Circle #44; see card pg 81

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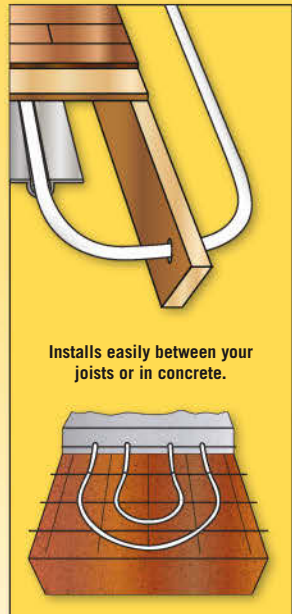
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Circle #49; see card pg 81

An A-pee-ling Nitrogen Fix

In the article "Do Compost Accelerators Work?" (Ask Our Experts, April/May 2015), the author recommended adding nitrogen to a compost pile to accelerate the pile's decomposition. The free sources of nitrogen mentioned, however, aren't always available. I do know of one source of nitrogen that's always available and free—urine. Peeing in a container and then pouring it onto a compost pile will help the compost finish faster, and will also save water by reducing the number of toilet flushes.

*Kirk Miller
Richardson, Texas*

A Treasured Publication

I just got my June/July 2015 issue. I'm only halfway through reading it, but I'm near tears of gratitude that this treasure still exists (especially after Rodale made the disastrous decision to dump *Organic Gardening* magazine). Keep up the essential, great work, MOTHER!

*Valerie Lord
Malta, New York*

Realistic Expectations

Steve Maxwell's February/March 2015 article "The Most Important Self-Reliance Skill Ever" is spot on. It's so rewarding to spend time in my garden, cook from scratch, and do as much for myself as I can. After a full

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Circle #62; see card pg 81

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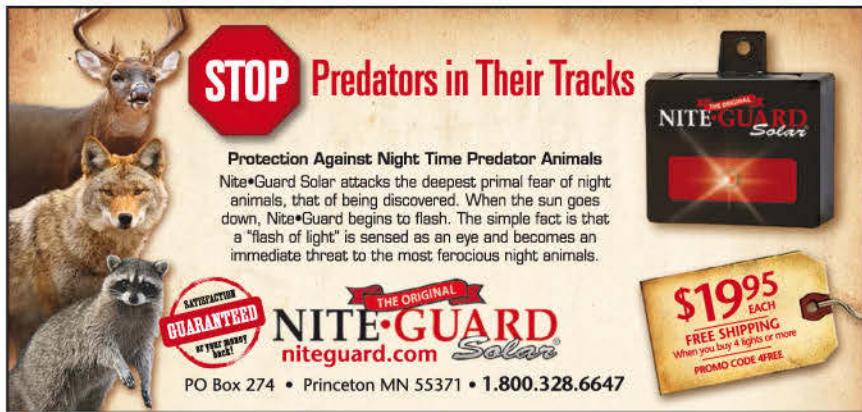
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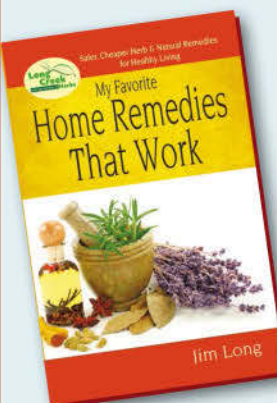
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day's work, I am more than ready for bed. I wake up early—too early for some people. I have to cook my own meals and plant my garden on time if I want to eat.

Thank you for validating the way self-reliance really works. Some people may not make these life choices, but I wouldn't have it any other way. The satisfaction of knowing I can—and am able to—pass this lifestyle on to my three daughters speaks for itself.

If a job is truly satisfying, it never seems like work. Relaxing comes after a full day, with a cup of tea and a copy of MOTHER EARTH NEWS to read while I'm curled up in bed with my dog. Thank you for a wonderful magazine and for the writers who make it a joy to read.

Carolyn Martens
Windsor, Ontario

Shame on Smoking Ad

I was utterly disappointed when I began reading the April/May 2015 issue and found an advertisement for Natural American Spirit tobacco. How can a magazine that promotes healthy living and sustainable existence think it's OK to have an ad for one of the largest preventable causes of disease in our society? While I understand advertisements are necessary to finance the production of the magazine, I believe a terrible line has been crossed. Shame on you, MOTHER EARTH NEWS.

Catherine Lalonde
Dawson City, Yukon

A+ Customer Service

I have to give a shout-out to MOTHER EARTH NEWS' customer support! My June issue was damaged in the mail, so I emailed your support team for a new copy. Bam! Within 30 minutes you had replied with a friendly email saying a new copy was being sent to me. Now *that's* good customer service!

Valerie Shoopman
Belton, Missouri

The Kogi Tribe: Teaching by Example

I am aware that your magazine is primarily focused on gardening, natural health, renewable energy, green building, etc., and tends not to delve too deeply into spiritual topics. I respect that position, and I gather it's because your intention is to appeal to a

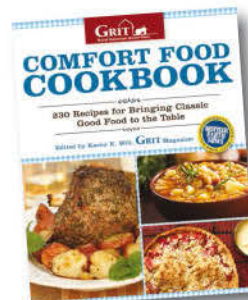


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wide audience that shares a common goal of living harmoniously on the planet. However, I deeply identify with the founder of the magazine, John Shuttleworth, in his quote, "I think that we live in an unbelievably marvelous Garden of Eden. We're surrounded by miraculous life-forms almost without number that are kept alive by a mysteriously interwoven, self-replenishing support system that—even with all of our scientific 'break-throughs'—we still don't understand."

I feel there is actually a crossover that needs to be addressed, and I can't seem to stop thinking that your magazine has the potential to do this. What I am referring to, in part, is indigenous wisdom, and the potential we have to learn from surviving cultures that still live according to what they refer to as the "Great Mother's" original rules and codes. I have written an article about a particular tribe that embodies this mindset, the Kogi, who live deep in the Sierra Nevada de Santa Marta in northern Colombia. Here's the link to my article, which originally appeared in *Pathways* magazine, for you to share with your readers: <http://goo.gl/mkCyMX>.

Michael Brasunas
Asheville, North Carolina

Competing Against 'Frankenfood'

Thanks to Shelley Stonebrook for her great article "Should We Be Spending More for Better Food?" (*Green Gazette*, June/July 2015). Let's not forget that the cost differential between "cheap," mass-produced food and food made with higher-quality, organic ingredients is artificially large because of the financial subsidies the government grants to big producers. Pull the plug on these economic monstrosities, and better-quality food won't have to compete nearly as hard as it does now against the Frankenstein-like food system.

Chad Nelson
Providence, Rhode Island

Home Depot Deception

I read that Home Depot was phasing out the use of bee-killing pesticides, such as neonicotinoids, on its nursery plants, and that it would require labels on any plants that still contained them. Last week, I was at Home Depot and saw a heather plant I wanted to purchase. I looked for a neonicotinoid label



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At Home Depot and other large nurseries, plants' pesticide labels are often hidden.

and found none, so, based on what I'd read, I assumed this plant was pesticide-free.

When I got home and unpotted the plant, however, the neonicotinoid label was in the pot *under* all the soil. I got online to research this hidden label, and I noticed that in the online comments for your article "Nursery Plants Contain Bee-Killing Chemicals" (Green Gazette, February/March 2014), a few of your readers had similar experiences.

At the store, Home Depot employees told me they have no control over these labels, so I called customer service representatives, who told me there's no policy about pesticide labeling. I filed a complaint with Maine consumer protection, but haven't heard back yet. The *Portland Press Herald* covered my story, and you can read more details of the case at <http://goo.gl/a9Yk6M>.

By the way, I still have the plant, but it contaminated my organic soil.

*Pam Jones
Kennebunk, Maine*

Distribution of Wealth

I read and took to heart your article "Monsanto Has Exposed Us to a 'Probable Carcinogen' for 40 Years" (News from MOTHER, June/July 2015). Most people recognize that organic foods (and strict labeling) are the way to go, but affordability is a real issue for most. The usual remedy is to suggest that farmers be pressed to lower their prices through greater efficiencies, but why not tackle it from the other end?

If we took away the excess dollars from sports figures, CEOs, stock traders and politicians; if we encouraged trade unions instead of hindering them; and if we redistributed excess money to the rest of us (instead of buying bombs to terrorize foreigners, and assault rifles and tasers to terrorize our own citizens), then everyone

Circle #48; see card pg 81

Circle #24; see card pg 81



Dear MOTHER

could afford to buy organic foods, and organic farmers wouldn't be facing stressful financial breakdowns.

Pat Gibbs

Maple Ridge, British Columbia

Loving Country Lore

I really enjoy the Country Lore department. Though I always appreciate and value the entire magazine's content, this "top tips" section gives me instant, positive gratification. You know, some of the magazine's articles are a little heavy, with some doom and gloom, so it's nice to wrap it all up with a helpful hint or two.

Brooke Lindler

Fountain Inn, South Carolina

Peppermint Oil vs. Fire Ants

In response to the article "Which Homemade Garden Sprays Work Best?" (Ask Our Experts, June/July 2015)—I was told by a man who worked with the Louisiana State University College of Agriculture that his Alabama-based blueberry farm, which is home to more than 100 bushes, doesn't have fire ants because, each spring, he sprays the ground with 1 ounce of peppermint essential oil diluted in 1 gallon of water. I asked, "Does it kill them?" He said, "I don't know if it kills them or just makes them leave!" I have since used this to locally treat fire ant mounds, and he's right—the ants either abandon the mound or die.

Julia Norris

Coker, Alabama

A Swamp Cooler in Texas

The article "Try a New, Improved Swamp Cooler" (Green Gazette, June/July 2015) reminded me that we had a swamp cooler on top of a trailer house, which we lived in during the oil boom years in West Texas. I remember my mama climbing on top of the trailer to put ice cubes in the thing. It worked wonderfully!

Carmen Norwood

via Facebook

Happy New Reader

I was introduced to MOTHER EARTH NEWS a few months ago. When the new issue shows up in the mail, I read it cover to cover, and then I read and reread articles



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Circle #25; see card pg 81

until the next one arrives. Being relatively new to having my own planting area, I enjoyed Lloyd Kahn's article "Top Tools for a Half-Acre Homestead" in the June/July 2015 issue. It contained some really good ideas, including a unique chicken coop design and tips for raised garden beds. Kahn recommends constructing everything relatively inexpensively or from scrap parts. The whole magazine is filled with tips that are pure gold. Keep 'em coming, MOTHER!

John Beliveau
Portland, Maine

Quill You ID This Critter?

The June/July 2015 issue was most enjoyable, but I couldn't figure out what kind of animal was featured in your EarthWords department on Page 96!

Betty Harwood
Roseburg, Oregon

Betty, the animal featured on the page (shown below) is a young porcupine; it's nibbling on an iris flower. —MOTHER



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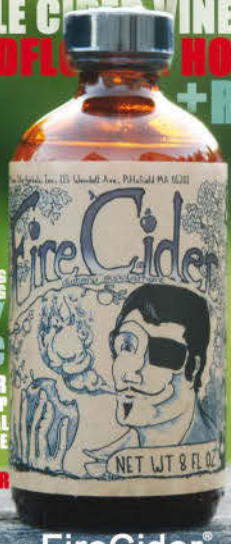
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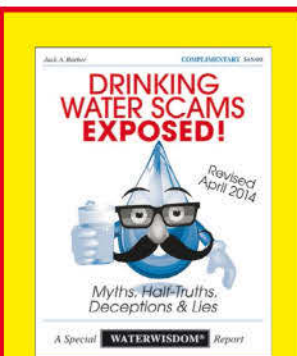
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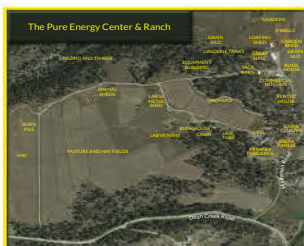
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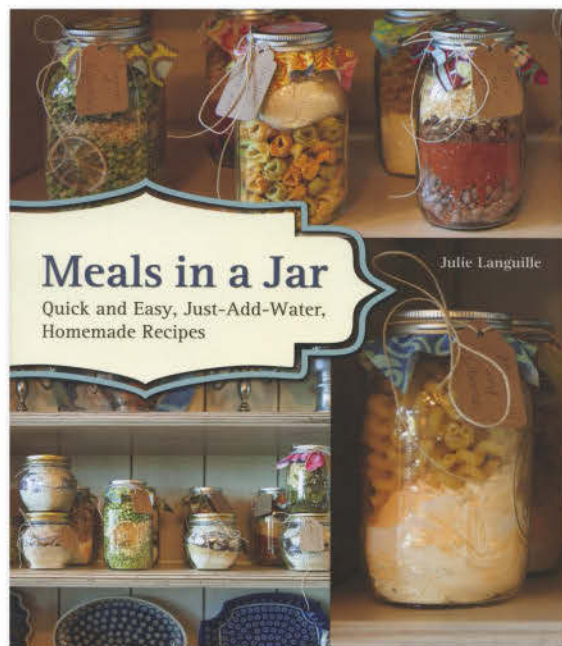
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